SVT-1000P/5050P

SERVICE MANUAL

E Model

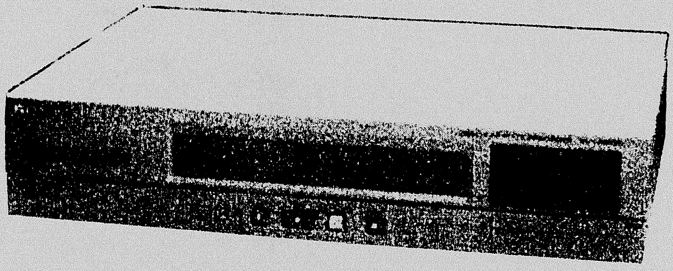

Photo : SVT-5050P

SPECIFICATIONS

General

Recording method	Dual-head rotating helical scanning system
Audio recording	In 3-, 12-, and 24-hour modes
Tape speed	23.39 mm/sec (3-hour mode)
Specified video cassette tape	VHS 1/2 in. video cassette tape
Recording/playback time (SVT-1000P)	3, 12, 24, 48 and 72 hours (when using E-180 tape)
Recording/playback time (SVT-5050P)	3, 12, 24, 48, 72, 96, 120, 168, 240, 480, 720 and 960 hours (when using E-180 tape)
Fast-forward/rewind time	Approx. 4 minutes (when using E-180 tape)
Color system	PAL color TV system

Video

Recording method	Luminance signal: FM method Color signal: Low-pass band-pass Transformation direct recording method
Input	BNC: 1 Vp-p, BNC, 75 ohms unbalanced
Output	BNC: 1 Vp-p, BNC, 75 ohms unbalanced
Horizontal resolution (SVT-1000P)	Black & white mode: 320 lines or more Color mode: 240 lines or more
Horizontal resolution (SVT-5050P)	Black & white mode: 350 lines or more Color mode: 240 lines or more

Audio

Input	315 mV (−7.8 dBs), phono jack 47 kilohms unbalanced
Output	315 mV (−7.8 dBs), phono jack 600 ohms unbalanced
Microphone input	−60 dBs, 3.5 mm minijack, 600 ohms impedance

Connector (SVT-1000P)

Alarm input	Low level
Alarm output	+5 V, 5.7 kilohms (Low active)
Switch output	+5 V, 5.7 kilohms (Low active)
Tape end output	+5 V, 5.7 kilohms (Low active)
Warning output	+5 V, 5.7 kilohms (Low active)
External timer input	Low level
Remote control input	3.5 mm minijack

Connector (SVT-5050P)

Alarm input	Low level
Alarm output	+5 V, 5.7 kilohms (Low active)
Switch output	+5 V, 5.7 kilohms (Low active)
Tape end output	+5 V, 5.7 kilohms (Low active)
Warning output	+5 V, 5.7 kilohms (Low active)
Timer output	+12 V, 5.7 kilohms (High active)
External timer input	Low level
Clock set output	+5 V, 5.7 kilohms (Low active)
Clock set input	Low level
Series output	+5 V, 5.7 kilohms (Low active)
Series input	Low level
One-shot input	Low level
Alarm reset	Low level
Remote control input	3.5 mm minijack

– Continued on page 2 –

MICROFILM

VIDEO CASSETTE RECORDER

SONY®

Other specifications

Operating temperature range	5°C to 40°C
Operating humidity range	80% or less
Power supply	220 – 240 V AC, 50 Hz
Power consumption	18 W
External dimensions	Approx. 420 × 100 × 340 mm (w/h/d) (16 ⅝ × 4 × 13 ½ in.)
Mass	Approx. 5.8 kg (12 lb 9 oz)

Supplied accessory

AC power cord (1)

Optional accessory

SVT-RS1 Computer Interface Board

Design and specifications are subject to change without notice.

SAFETY RELATED COMPONENT WARNING

Components identified by shading and ⚠ marked on the schematic diagrams and parts list are critical to safe operation. Replace these components with SONY parts whose part numbers appear as shown in this manual or in supplements published by SONY.

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1-1. PRECAUTIONS

On safety

- Operate the unit on 220 V – 240 V AC, 50 Hz only.
- The nameplate indicating operating voltage, power consumption, etc., is located on the rear of the unit.
- Should any solid object or liquid fall into the cabinet, turn off the power, unplug the unit and have it checked by qualified personnel before operating it any further.
- Do not drop or place heavy objects on the power cord. If the power cord is damaged, turn off the power immediately. It is dangerous to use the unit with a damaged power cord.
- Connect the power cord to the wall AC outlet. For connecting the power source, see "Connecting a Camera, Monitor and Microphone" on page 8.
- Unplug the unit from the wall outlet if it is not to be used for several days or more.
- Disconnect the power cord from the wall AC outlet by grasping the plug, not by pulling the cord.

On installation

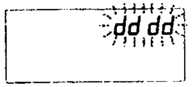
- Do not place a heavy object on the unit.
- Allow adequate air circulation to prevent internal heat build-up. Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation slots.
- Do not install the unit in a location near heat sources such as radiators or air ducts.
- Place the unit to avoid direct sunlight.
- Do not install the unit in a place subject to mechanical vibration or shock.
- Do not put magnetic objects close to the unit and cassette tape. Magnetic fields may affect the color reproduction of the unit and cause distortion.
- Whenever you changed the place of the installation, degauss the unit.
- The unit is designed for operation in a horizontal position. Do not install it in an inclined position.

On operation

When the unit is not in use, turn the power off to conserve energy and to extend its life.

On moisture condensation

If the unit is brought directly from a cold to a warm location, moisture may condense on the video head drum. In this condition, the tape may adhere to the head drum and cause serious damage to the head. To avoid damage caused by moisture condensation, be sure not to leave a cassette inside the compartment when the unit will not be used. If moisture condensation is present, the "dddd" indicator flashes in the display window and the unit will not operate. When the "dddd" indicator disappears, you can operate the unit.



On video cassettes

Remove and store video cassettes after recording or playback.

On cleaning

As a safety precaution, unplug the unit before cleaning it.

- To keep the unit looking brand-new, periodically clean it with a mild detergent solution. Never use strong solvents such as thinner or benzine, or abrasive cleaners since they will damage the cabinet. When cleaning, keep liquid away from electrical contacts and connectors.
- When there is a buildup of dust on air vents, use a vacuum cleaner to remove it.

On repacking

- Before repacking, disconnect all cables and connecting cords.
- Do not throw away the carton and packing materials. They make an ideal container with which to transport the unit. When shipping the unit to another location, repack it as illustrated on the carton.

On transportation

When transporting the unit, protect it from vibration and impact.

If you have any questions about this unit, contact your authorized Sony dealer.

1-2. FEATURES

Field recording/field playback

Because single fields can be recorded one by one in time lapse mode and all fields can be viewed separately during playback, you can record more information.

Audio recording in 12-/24-mode

You can record audio information with video information even in 12- or 24-hour mode and listen to it by selecting audio mode during playback.

Various recording functions

- **Repeat recording:** When the tape reaches the end, the VCR rewinds the tape and starts recording again from the beginning of the tape.
- **Timer recording:** You can set the timer on daily recording or weekly recording.
- **Alarm recording:** If an externally connected alarm sensor is triggered, you can make a complete recording of the situation that triggered the alarm.
- **One-shot recording:** Recording can be done on a single-field basis.

Mode settings on monitor

You can set the modes for all functions, such as the internal timer setting, the alarm recording mode settings, etc. on the monitor.

Series recording function

This function permits long-term continuous recording using two or more time lapse VCRs.

Multiple recording modes

The time lapse intervals for recording can be set in 12 steps. At the longest interval setting, available recording time is a full 960 hours (40 days) with one 180-minute tape.

Used time indicator

This VCR has a built-in microprocessor equipped with a calendar function and shows used time of head drum and power on time on the monitor screen.

Alarm search and scan function

You can search/scan the alarm recording and play it back for five seconds.

Time and date retrieval function

Because this unit uses a high-performance VASS, recordings made in time lapse mode can be searched by date and time, a valuable type of search function in time lapse VCRs.

Forward/reverse field advance

This VCR offers improved search functions with the ability to move both forwards and backwards between fields.

Clock operation backup

When a power interruption occurs, the built-in rechargeable battery will provide backup power for the clock for up to 30 days.
Essential data, such as data setting, internal timer settings, recording time, and mode settings, and alarm recording mode settings are also retained.

Security lock

To guard against operation errors, this VCR locks all of the buttons.

Monitoring the recording condition

You can check the recorded image during recording by pressing a single button.

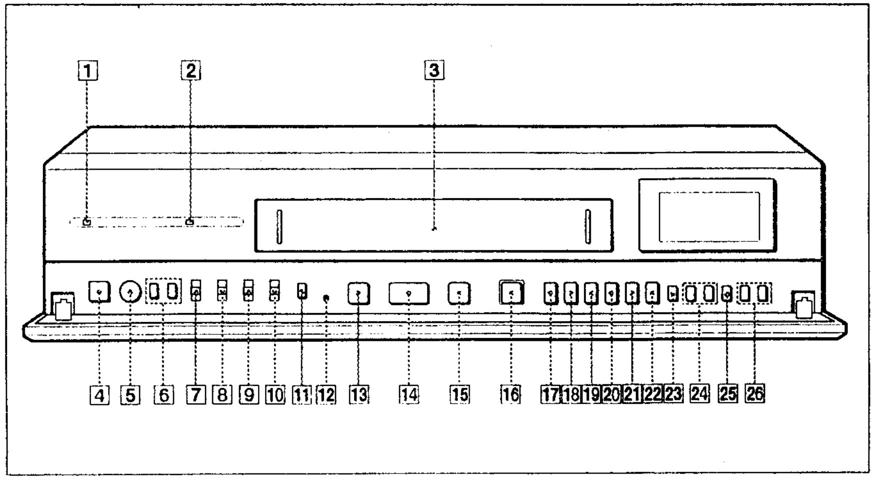
RS-232C interface

By installing an optional SVT-RS1 Computer Interface Board, you can control this VCR from a personal computer via RS-232C interface.

This section is extracted from instruction manual.

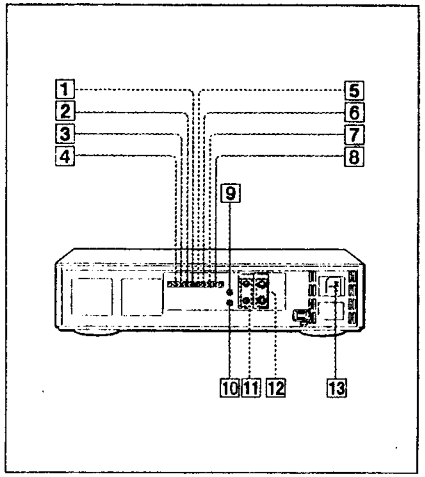
1-3. LOCATION OF PARTS AND CONTROLS (SVT-1000P)

Front Panel (Refer to pages in parentheses for details.)



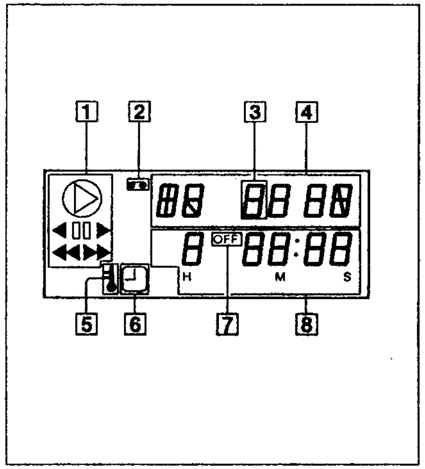
1 ON indicator
2 REPEAT indicator (16)
3 Cassette compartment
4 ON/STANDBY switch
5 SHARPNESS control (28)
6 TRACKING +/– buttons (29, 30)
7 ALARM SPEED switch (25)
8 ALARM DURATION switch (25)
9 REPEAT REC switch (16)
10 ON-SCREEN switch (12)
11 TIMER button (20, 22, 24)
12 MENU RESET button (16, 22, 24, 26, 27)
13 ⏏ EJECT button (14)
14 ● REC button
15 REC CHECK button (17)
16 ■ STOP button
17 ◀◀ REW button
18 ▶ PLAY button
19 ▶▶ FF button
20 ❚❚ PAUSE button
21 ◀ REV button
22 SEARCH/AUDIO ON button (10, 28)
23 MENU button (10)
24 SHIFT ▼/▶ buttons (10)
25 COUNTER RESET button (28)
26 REC/PLAY SPEED +/– buttons (10)

Rear Panel (Refer to pages in parentheses for details.)



1 END OUT terminal (33)
2 WARNING OUT terminal (32)
3 COM (common) terminal (32)
4 EXT TIMER terminal (23)
5 SW OUT terminal (32)
6 COM (common) terminal (32)
7 ALARM OUT terminal (25)
8 ALARM IN terminal (25)
9 MIC IN jack (8)
10 REMOTE jack (33)
11 AUDIO IN/OUT jacks (phono type)
12 VIDEO IN/OUT jacks (BNC type) (8)
13 AC IN (inlet) (8)

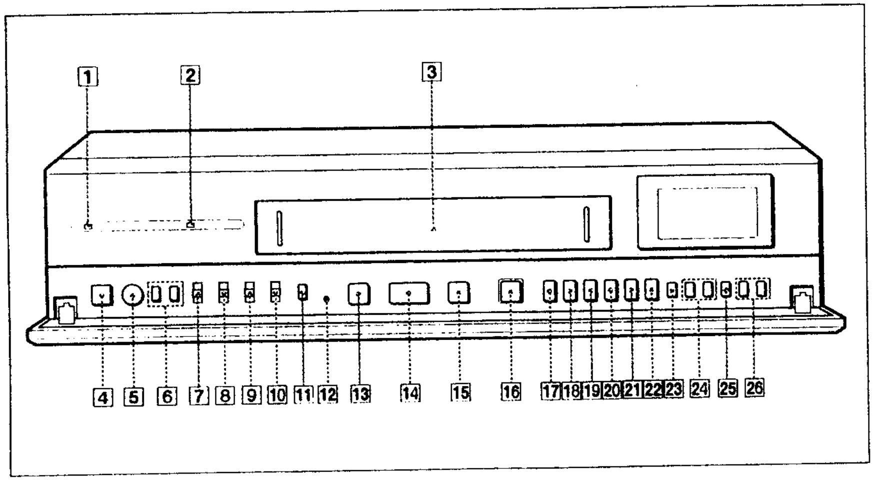
Display Window



1 Tape operation indicators
2 Cassette indicator
3 Power interruption indicator
4 Tape speed/Alarm/Moisture condensation
5 Security lock indicator
6 Timer recording standby indicator
7 OFF indicator
8 Linear time counter/Timer recording indicator

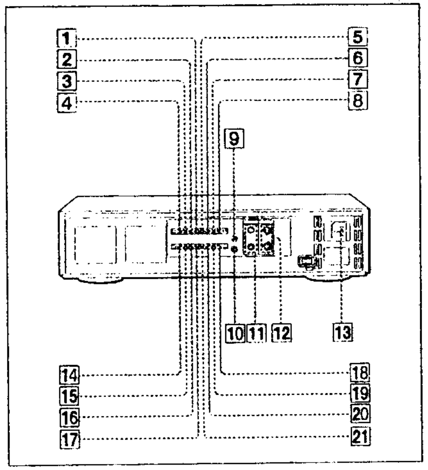
1-4. LOCATION OF PARTS AND CONTROLS (SVT-5050P)

Front Panel (Refer to pages in parentheses for details.)



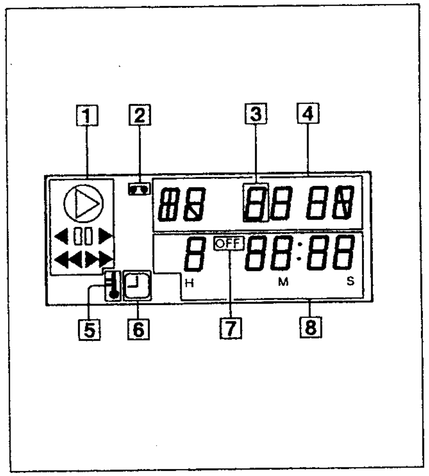
1 ON indicator
2 REPEAT indicator (16)
3 Cassette compartment
4 ON/STANDBY switch
5 SHARPNESS control (31)
6 TRACKING +/– buttons (32, 34)
7 ALARM SPEED switch (25)
8 ALARM DURATION switch (25)
9 REPEAT REC switch (16)
10 ON-SCREEN switch (12, 27, 33)
11 TIMER button (20, 22, 24)
12 MENU RESET button (17, 22, 24, 27, 28)
13 ⏏ EJECT button (14)
14 ● REC button
15 REC CHECK button (17)
16 ■ STOP button
17 ◀◀ REW button
18 ▶ PLAY button
19 ▶▶ FF button
20 ❚❚ PAUSE button
21 ◀ REV button
22 SEARCH/AUDIO ON button (10, 31)
23 MENU button (10)
24 SHIFT ▼/▶ buttons (10)
25 COUNTER RESET button (31)
26 REC/PLAY SPEED +/– buttons (10)

Rear Panel (Refer to pages in parentheses for details.)



1 END OUT terminal (38)
2 WARNING OUT terminal (37)
3 COM (common) terminal (37)
4 EXT TIMER terminal (23)
5 SW OUT terminal (36)
6 COM (common) terminal (36)
7 ALARM OUT terminal (25)
8 ALARM IN terminal (25)
9 MIC IN jack (8)
10 REMOTE jack (38)
11 AUDIO IN/OUT jacks (phono type)
12 VIDEO IN/OUT jacks (BNC type) (8)
13 AC IN (inlet) (8)
14 CLOCK SET OUT terminal (36)
15 CLOCK SET IN terminal (36)
16 SERIES OUT terminal (9)
17 SERIES IN terminal (9)
18 ALARM RESET terminal (27)
19 1 SHOT IN terminal (29)
20 TIMER OUT terminal (36)
21 COM (common) terminal (36)

Display Window



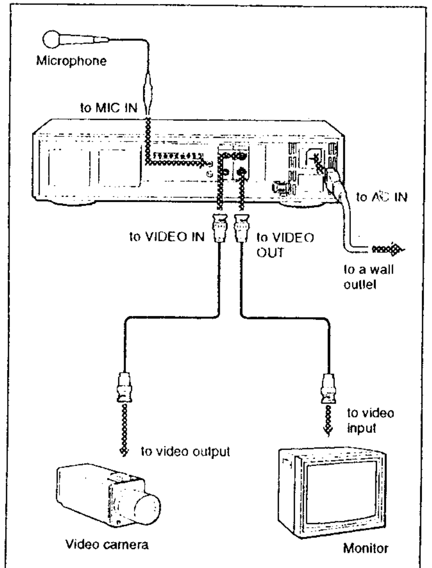
1 Tape operation indicators
2 Cassette indicator
3 Power interruption indicator
4 Tape speed/Alarm/Moisture condensation
5 Security lock indicator
6 Timer recording standby indicator
7 OFF indicator
8 Linear time counter/Timer recording indicator

1-5. CONNECTIONS (SVT-1000P)

Turn all the power off before making connections. Connect the AC power cord last.

Connecting a Camera, Monitor and Microphone

With the following connections, you can monitor the picture and sound.


Microphone
to MIC IN
to AC IN
to VIDEO IN
to VIDEO OUT
to a wall outlet
to video input
to video output
Video camera
Monitor

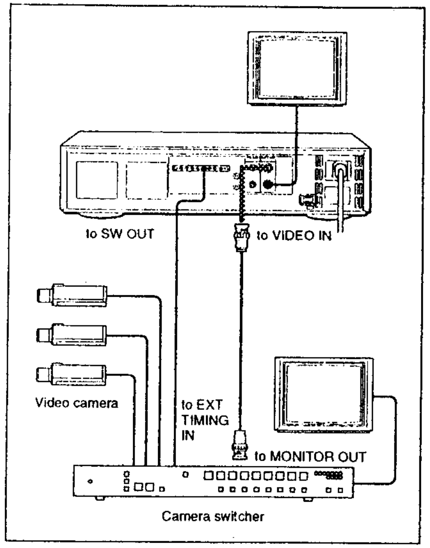
Use of BNC connector

Align pin with cutout, insert and turn right to lock.
To remove, turn left and pull out.

To connect an alarm sensor

Refer to page 25.

Connecting a Switcher

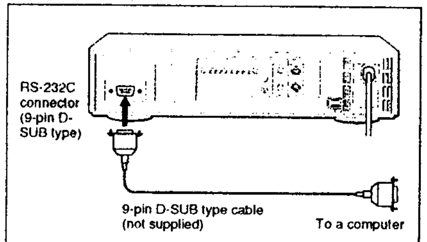

to SW OUT
to VIDEO IN
Video camera
to EXT TIMING IN
to MONITOR OUT
Camera switcher

Note

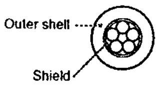
When you connect several cameras to a switcher, synchronize the cameras.
If not, the picture will be disturbed.

Connecting a Computer

To connect to a computer, use the SVT-RS1 Computer Interface Board (not supplied).
For details about installation and control from a computer, see the instruction manual of the SVT-RS1.


RS-232C connector (9-pin D-SUB type)
9-pin D-SUB type cable (not supplied)
To a computer

Interface cable to be connected to the RS-232C connector must be shielded as follows.

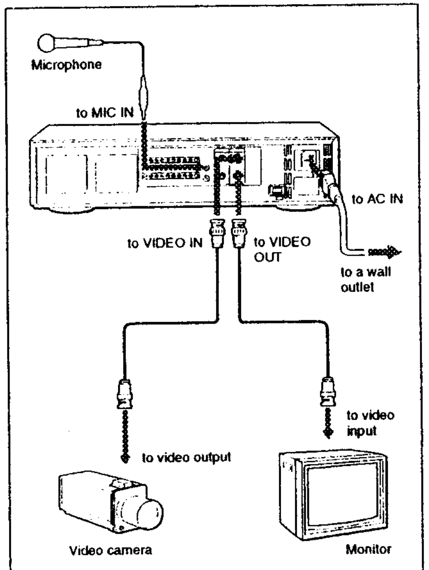

Outer shell
Shield

1-6. CONNECTIONS (SVT-5050P)

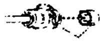
Turn all the power off before making connections. Connect the AC power cord last.

Connecting a Camera, Monitor and Microphone

With the following connections, you can monitor the picture and sound.


Microphone
to MIC IN
to AC IN
to VIDEO IN
to VIDEO OUT
to a wall outlet
to video input
to video output
Video camera
Monitor

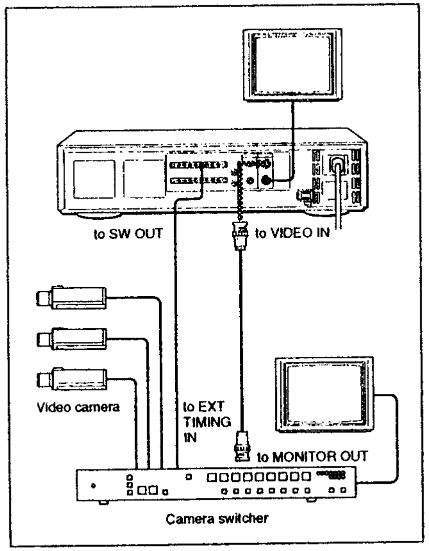
Use of BNC connector



Align pin with cutout, insert and turn right to lock.
To remove, turn left and pull out.

To connect an alarm sensor
Refer to page 25.

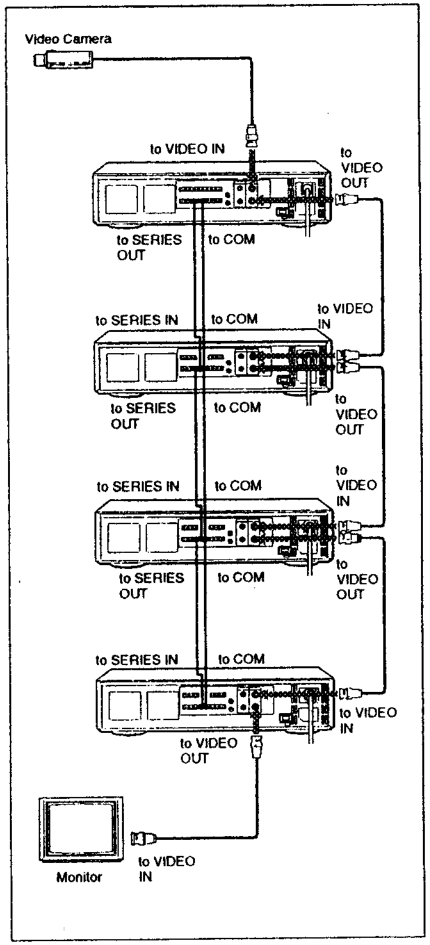
Connecting a Switcher


to SW OUT
to VIDEO IN
Video camera
to EXT TIMING IN
to MONITOR OUT
Camera switcher

Note

When you connect several cameras to a switcher, synchronize the cameras.
If not, the picture will be disturbed.

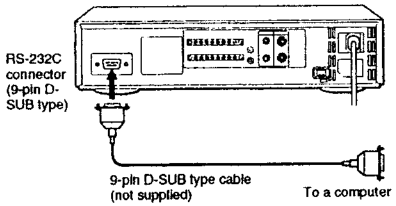
Connecting Another Unit in Series


Video Camera
to VIDEO IN
to VIDEO OUT
to SERIES OUT
to COM
to SERIES IN
to COM
to VIDEO IN
to SERIES OUT
to COM
to VIDEO OUT
to SERIES IN
to COM
to VIDEO IN
to SERIES OUT
to COM
to VIDEO OUT
to SERIES IN
to COM
to VIDEO IN
to VIDEO OUT
Monitor
to VIDEO IN

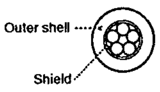
For operation, refer to page 16.

Connecting a Computer

To connect to a computer, use the SVT-RS1 Computer Interface Board (not supplied).
For details about installation and control from a computer, see the instruction manual of the SVT-RS1.

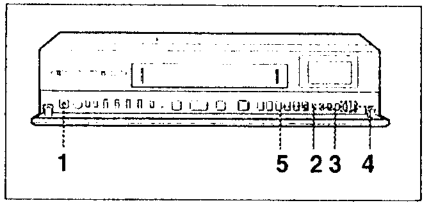

RS-232C connector (9-pin D-SUB type)
9-pin D-SUB type cable (not supplied)
To a computer

Interface cable to be connected to the RS-232C connector must be shielded as follows.


Outer shell
Shield

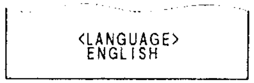
1-7. SETTING THE LANGUAGE

Select either English, French or German for the display language.

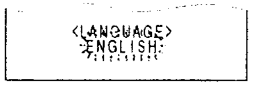


1 Turn on the power.

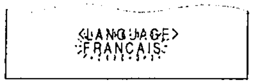
2 Press MENU until the LANGUAGE display appears on the monitor screen.


<LANGUAGE>
ENGLISH

3 Press SHIFT ▼ so that ENGLISH flashes.


<LANGUAGE>
ENGLISH

4 Press REC/PLAY SPEED +/– to select the language.


<LANGUAGE>
FRANCAIS

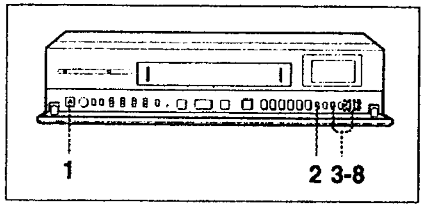
5 Press SEARCH to return to the normal display.

Note

When you want to change the language again, repeat steps 2 to 5 after step 5.

1-8. SETTING THE CLOCK

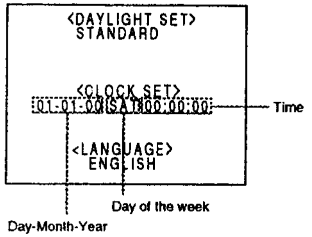
Set the clock to the current time and date on the monitor screen. For Daylight Saving Time, proceed the steps in "Adjusting to Daylight Saving Time" on page 12 first.



Example:
Set the date and time to 15:20 on 15 October, 1996.

1 Turn on the power of the equipment to be used.

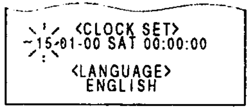
2 Press MENU until the CLOCK SET display appears on the monitor screen.
The first display shows 1 January, 2000.


<DAYLIGHT SET>
STANDARD

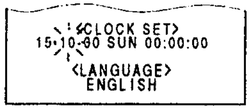
<CLOCK SET>
01-01-00 SAT 00:00:00

<LANGUAGE>
ENGLISH

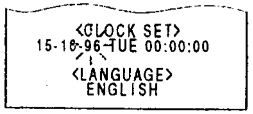
3 Set the day by pressing REC/PLAY SPEED +/–, then press SHIFT ▶.


<CLOCK SET>
15-01-00 SAT 00:00:00
<LANGUAGE>
ENGLISH

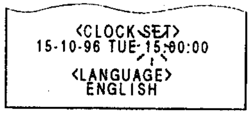
4 Set the month by pressing REC/PLAY SPEED +/–, then press SHIFT ▶.


<CLOCK SET>
15-10-00 SUN 00:00:00
<LANGUAGE>
ENGLISH

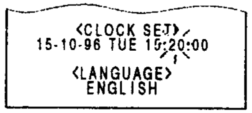
5 Set the year by pressing REC/PLAY SPEED +/–, then press SHIFT ▶.


<CLOCK SET>
15-10-96 TUE 00:00:00
<LANGUAGE>
ENGLISH

6 Set the hour by pressing REC/PLAY SPEED +/–, then press SHIFT ▶.


<CLOCK SET>
15-10-96 TUE 15:00:00
<LANGUAGE>
ENGLISH

7 Set the minutes by pressing REC/PLAY SPEED +/–, then press SHIFT ▶.


<CLOCK SET>
15-10-96 TUE 15:20:00
<LANGUAGE>
ENGLISH

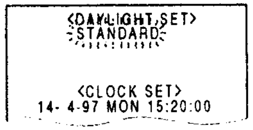
8 Press REC/PLAY SPEED – simultaneously with a time signal.
You can set the clock at the 00 second point.

9 After setting the date and time, press SEARCH to return to the normal display.

Adjusting to Daylight Saving Time

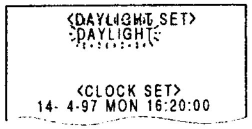
After setting the time in Standard Time, you can adjust to Daylight Saving Time when the season changes.

1 Press MENU until the DAYLIGHT display appears on the monitor screen.



```
<DAYLIGHT SET>
 STANDARD


<CLOCK SET>
14- 4-97 MON 15:20:00
```

2 Press REC/PLAY SPEED +/– to select DAYLIGHT.
The clock moves forward one hour.



```
<DAYLIGHT SET>
 DAYLIGHT


<CLOCK SET>
14- 4-97 MON 16:20:00
```

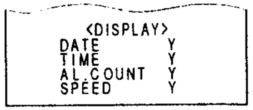
3 Press SEARCH to return to the normal display.

Setting the Time/Date Display

You can display four items of information, date, time, number of alarm recordings and recording/playback speed and turn off each item which you do not want to display.

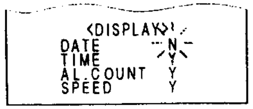
1 Turn on the power of the equipment to be used.

2 Press MENU until the DISPLAY display appears on the monitor screen.



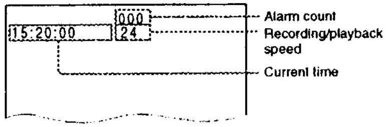
```
<DISPLAY>
DATE       Y
TIME       Y
AL.COUNT   Y
SPEED      Y
```

3 Press SHIFT ▼ so that the item to be set flashes and REC/PLAY SPEED +/– to set to Y(yes) or N(no).
Example: When you set the date display to N.



```
<DISPLAY>
DATE       N
TIME       Y
AL.COUNT   Y
SPEED      Y
```

4 Press SEARCH to return to the normal display (time/date screen).



```
          000
15:20:00  24
```

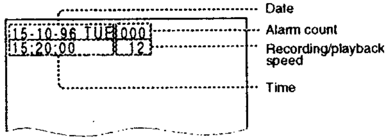
To turn off the screen display

Set the ON-SCREEN switch to OFF.

Changing the Display Position of the Time/Date Display

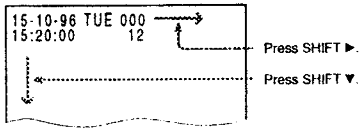
You can change the position of the time/date display that appears on the monitor screen.

1 Turn on the power of the equipment to be used.
The normal display appears.



```
15-10-96 TUE 000
15:20:00      12
```

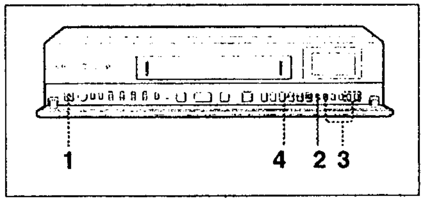
2 Change the display position as follows.
To move the display downwards, press SHIFT ▼.
(When the display reaches the bottom of the screen, the display returns to the top of the screen.)
To move the display rightwards, press SHIFT ▶.
(When the display reaches the right-hand edge of the screen, the display returns to the left-hand edge of the screen.)



```
15-10-96 TUE 000
15:20:00      12
```

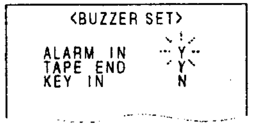
1-9. SETTING THE BUZZERS

You can turn on/off three types of buzzers:
- **ALARM IN buzzer**: beeps while it receives an alarm signal. (See "Alarm Recording" for more information on page 25.)
- **TAPE END buzzer**: beeps when the tape reaches its end.
- **KEY IN buzzer**: beeps when you press a button.



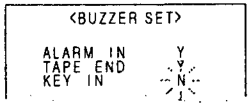
1 Turn on the power of the equipment to be used.

2 Press MENU until the BUZZER SET display appears on the monitor screen.



```
<BUZZER SET>

ALARM IN     Y
TAPE END     Y
KEY IN       N
```

3 Press SHIFT ▼ so that the item to be set flashes and REC/PLAY SPEED +/– to set to Y (yes) or N (no).



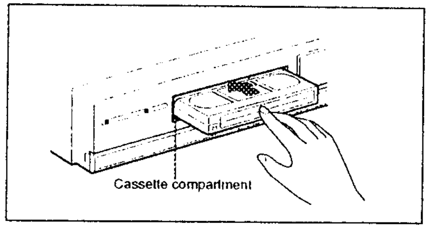
```
<BUZZER SET>

ALARM IN     Y
TAPE END     Y
KEY IN       N
```

4 Press SEARCH to return to the normal display.

1-10. HANDLING A VIDEO CASSETTE

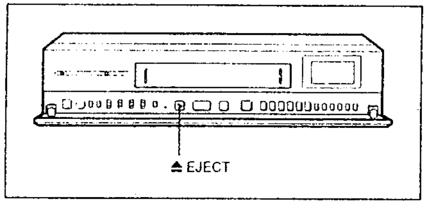
This section shows you how to insert a video cassette into the VCR.

Inserting a Video Cassette



Insert the cassette into the cassette compartment by slowly pressing its center with the arrow on the top. When the cassette is inserted, the VCR automatically turns on and the ▪▪ indicator lights in the display window.
If you insert the cassette without its safety tab for recording, the VCR ejects the cassette automatically.

Ejecting the Video Cassette

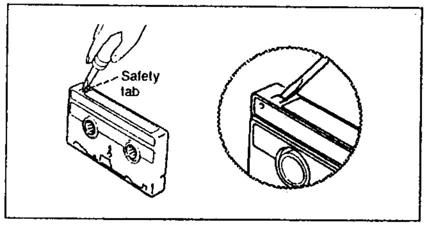


Press ≜ EJECT on the VCR.
You can eject the cassette even when the power is off.
When you press ≜ EJECT, the VCR turns on automatically.
After ejecting the cassette, the VCR turns off again.

Recommended cassette
This VCR is designed and calibrated with 180-minute tape (Sony E-180). To ensure stable operation and optimum picture quality, we recommend that you use a Sony 180-minute tape.

Protecting Your Cassette from Being Erased

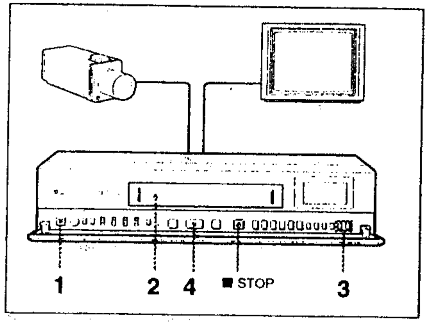
Remove the tab on the cassette with a screwdriver or a similar tool as shown below. This protects your cassette against an accidental recording.



If you want to record again on the cassette without its safety tab, simply cover the safety tab hole with a piece of plastic tape.

1-11. RECORDING (SVT-1000P)

This section shows you how to record the signal from the video camera in the normal or time lapse mode, to set the security lock and to record repeatedly on the same cassette.



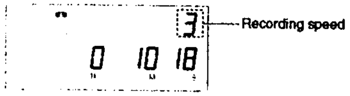
1 Turn on the power of the equipment to be used.

2 Insert the cassette.

3 Set the recording speed by pressing REC/PLAY SPEED +/–.

Recording speed	Maximum recording time with 180-minute tape (hour)		Interval (sec.)	Audio recording	Tape motion
3	Standard mode	3	1/50	Possible	Continuous
12	Time lapse mode*¹	15	0.1		
24		27	0.18		
48		51	0.34	No	Intermittent
72		75	0.5		

*¹ In time lapse modes, it is possible to record additionally three hours longer than the displayed recording time.



In the display window

4 Press ● REC.
Recording starts.

To stop recording
Press ■ STOP.

If recording does not start and the cassette is ejected
The tab on the cassette is removed to protect against accidental recording.

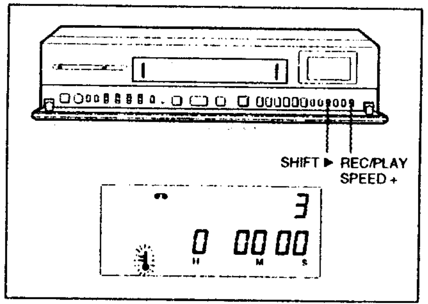
When the tape reaches the end
When REPEAT REC is set to OFF (see page 16), the tape is rewound to the beginning of the tape and stops. The OFF indicator lights in the display window.
Press ● REC, ▶▶ FF, ◀◀ REW or ▶ PLAY to turn off the OFF indicator.

Note
Whenever you insert a tape and first start recording, Adaptive Picture Control (APC) automatically improves recording quality by adjusting the VCR to the condition of the video heads and tape. There is about a 6-second delay before the VCR actually starts recording when ● REC is pressed.

Locking the Record Mode — Security Lock Function

Locking the record mode is useful to guard against accidental recording interruptions when the VCR is used for surveillance or monitoring purposes.

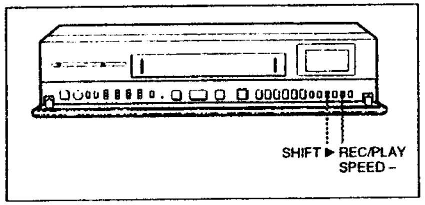
To set the security lock
While pressing SHIFT ▶, press REC/PLAY SPEED +.
The 🔒 indicator lights in the display window.



The security lock function also works in timer recording and playback modes.
You can use the SHARPNESS control while the security lock function is working.

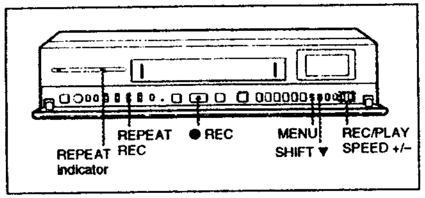
To release the security lock

While pressing SHIFT ▶, press REC/PLAY SPEED –. The 🔒 indicator turns off.

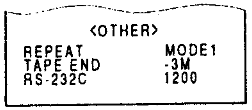


Recording on the Same Cassette Repeatedly — Repeat Recording

You can record on the same cassette repeatedly in two different modes: MODE 1 and MODE 2.



1 Press MENU until the OTHER display appears on the screen.



```
      <OTHER>
REPEAT        MODE1
TAPE END      -3M
RS-232C       1200
```

2 Press SHIFT ▼ to move the flashing to REPEAT and set the mode to MODE 1 or MODE 2 by pressing REC/PLAY SPEED +/–.
MODE 1: If an alarm input is received during repeat recording, the recording mode switches to alarm recording. After the end of the tape is reached, the tape is automatically rewound and stops at the beginning. The OFF indicator lights in the display window.
MODE 2: If an alarm input is received during repeat recording, the recording mode switches to alarm recording. Repeat recording is performed regardless of whether an alarm input is received or not.

3 Set REPEAT REC to ON.
The REPEAT indicator lights.

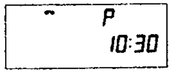
4 Press ● REC.
Recording begins.
When the tape reaches the end, the tape is rewound at the beginning and recording resumes.

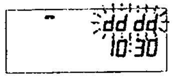
Note

If REPEAT REC is set to OFF while repeat recording is in progress, recording proceeds until the end of the tape is reached and then stops automatically after the tape is rewound at the beginning. The OFF indicator lights in the display window.

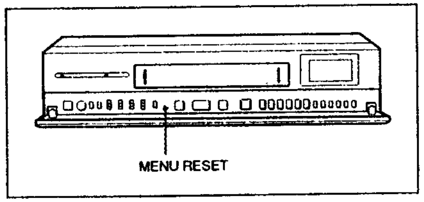
Recording after Power Interruption or Moisture Condensation

If a power interruption occurs, The P indicator lights in the display window and if a moisture condensation occurs, the "dddd" indicator flashes. Even if a power interruption or moisture condensation occurs while recording, the internal batteries provide backup power for memory for at least 30 days. The internal batteries can be charged in about 48 hours.
If the power is interrupted during recording, the recording starts automatically after power is restored.





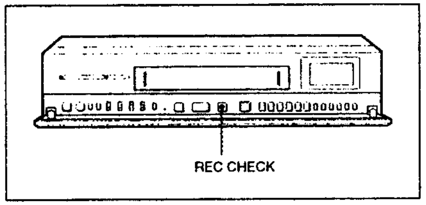
To clear the P indicator



Press MENU RESET.

Monitoring the Recording Condition

You can check the recording condition by pressing REC CHECK while recording in time lapse mode.



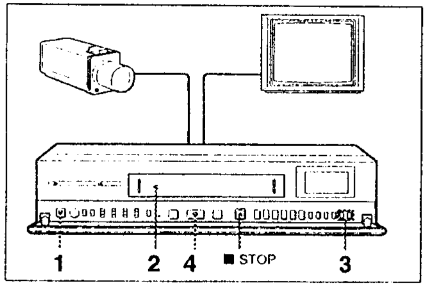
Press REC CHECK while recording.
After the tape is rewound for about three seconds and played back for about two seconds, the unit returns to the original recording mode.

Note

While monitoring the recording condition, recording is interrupted.

1-12. RECORDING (SVT-5050P)

This section shows you how to record the signal from the video camera in the normal or time lapse mode, to set the security lock and to record repeatedly on the same cassette.



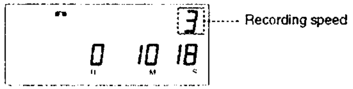
1 Turn on the power of the equipment to be used.

2 Insert the cassette.

3 Set the recording speed by pressing REC/PLAY SPEED +/–.

Recording speed	Maximum recording time with 180-minute tape (hour)		Interval (sec.)	Audio recording	Tape motion
3	Standard mode	3	1/50	Possible	Continuous
12	Time lapse mode*)	15	0.1		
24		27	0.18		
48		51	0.34	No	Intermittent
72		75	0.5		
96		99	0.66		
120		123	0.82		
168		171	1.14		
240		243	1.62		
360		363	2.42		
480		483	3.22		
720		723	4.82		
960		963	6.42		
000	1 shot	27,000	180		

*) In time lapse modes, it is possible to record additionally three hours longer than the displayed recording time.



In the display window

4 Press ● REC.
Recording starts.

To stop recording

Press ■ STOP.

If recording does not start and the cassette is ejected

The tab on the cassette is removed to protect against accidental recording.

When the tape reaches the end

When REPEAT REC is set to OFF (see page 16), the tape is rewound to the beginning of the tape and stops. The OFF indicator lights in the display window.
Press ● REC, ▶▶ FF, ◀◀ REW or ▶ PLAY to turn off the OFF indicator.

Note

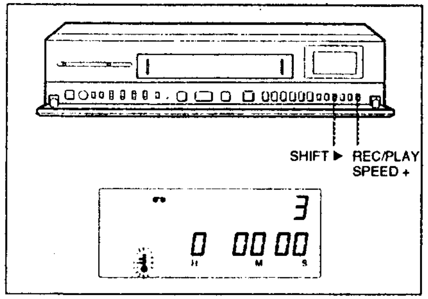
Whenever you insert a tape and first start recording. Adaptive Picture Control (APC) automatically improves recording quality by adjusting the VCR to the condition of the video heads and tape. There is about a 6-second delay before the VCR actually starts recording when ● REC is pressed.

Locking the Record Mode — Security Lock Function

Locking the record mode is useful to guard against accidental recording interruptions when the VCR is used for surveillance or monitoring purposes.

To set the security lock

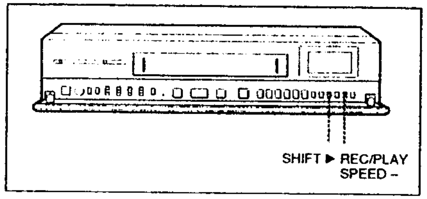
While pressing SHIFT ▶, press REC/PLAY SPEED +. The 🔒 indicator lights in the display window.



The security lock function also works in timer recording and playback modes.
You can use the SHARPNESS control while the security lock function is working.

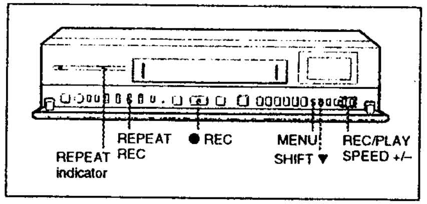
To release the security lock

While pressing SHIFT ▶, press REC/PLAY SPEED –. The 🔒 indicator turns off.

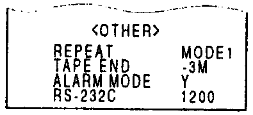


Recording on the Same Cassette Repeatedly — Repeat Recording

You can record on the same cassette repeatedly in two different modes: MODE 1 and MODE 2.



1 Press MENU until the OTHER display appears on the screen.



```
      <OTHER>
REPEAT        MODE1
TAPE END      -3M
ALARM MODE    Y
RS-232C       1200
```

2 Press SHIFT ▼ to move the flashing to REPEAT and set the mode to MODE 1 or MODE 2 by pressing REC/PLAY SPEED +/–.
MODE 1: If an alarm input is received during repeat recording, the recording mode switches to alarm recording. After the end of the tape is reached, the tape is automatically rewound and stops at the beginning. The OFF indicator lights in the display window.
MODE 2: If an alarm input is received during repeat recording, the recording mode switches to alarm recording. Repeat recording is performed regardless of whether an alarm input is received or not.

3 Set REPEAT REC to ON.
The REPEAT indicator lights.

4 Press ● REC.
Recording begins.
When the tape reaches the end, the tape is rewound at the beginning and recording resumes.

Note

If REPEAT REC is set to OFF while repeat recording is in progress, recording proceeds until the end of the tape is reached and then stops automatically after the tape is rewound at the beginning. The OFF indicator lights in the display window.

Series Recording

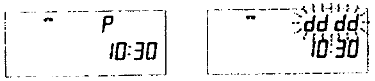
Connect another SVT-5050P for series recording (for details on connection, see page 9) and set each of the units as follows.

Item	Unit #1	Unit #2	Unit #3 and subsequent unit
SERIES on ALARM SET screen	Y	Y	Y
TAPE END on OTHER screen	–3M	–3M	–3M
Cassette tape (E-180)	Loaded	Loaded	Loaded
Operating status	Recording	Turned off	Turned off
REPEAT REC	OFF	OFF	OFF
Security lock	Locked	Locked	Locked
TIMER REC	OFF	OFF	OFF

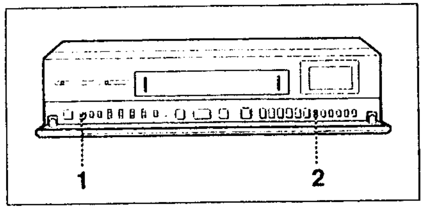
When all of the settings are complete, set unit #1 in recording mode and turn off the power of unit #2 and subsequent unit.
When recording on unit #1 is complete, the power for unit #2 turn on and recording begins (The recording cannot be done for about 11 seconds.).
The unit #1 rewinds its tape and turns off.
When an E-180 tape is used and TAPE END is set to –3M, the unit #2 starts recording before the unit #1 stops so that recording is continued without stop.

Recording after Power Interruption or Moisture Condensation

If a power interruption occurs, The P indicator lights in the display window and if a moisture condensation occurs, the "dddd" indicator flashes. Even if a power interruption or moisture condensation occurs while recording, the internal batteries provide backup power for memory for at least 30 days. The internal batteries can be charged in about 48 hours.
If the power is interrupted during recording, the recording starts automatically after power is restored.

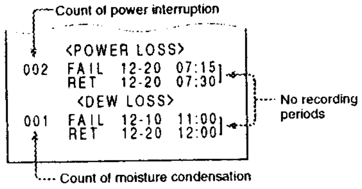


To check power interruptions or moisture condensation



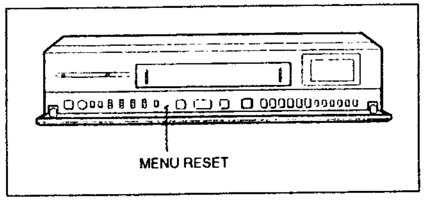
1 Turn on the power of the equipment to be used.

2 Press MENU until the POWER LOSS/DEW LOSS display appears.
This shows a count of the power interruption and moisture condensation and the period when the recording was interrupted.



```
       <POWER LOSS>
002  FAIL  12-20  07:15
     RET   12-20  07:30
       <DEW LOSS>
001  FAIL  12-10  11:00
     RET   12-20  12:00
```

To clear the P indicator



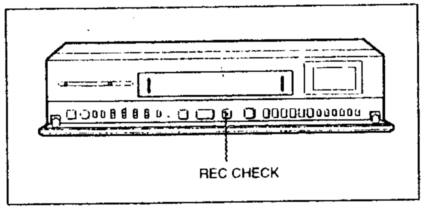
Press MENU RESET.

To clear the power loss /dew loss data

Press MENU RESET while the POWER LOSS/DEW LOSS display is on the screen.

Monitoring the Recording Condition

You can check the recording condition by pressing REC CHECK while recording in time lapse mode.

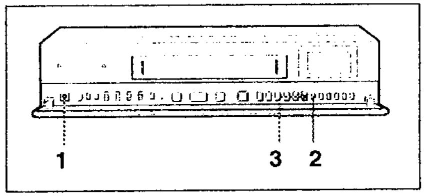


Press REC CHECK while recording.
After the tape is rewound for about three seconds and played back for about two seconds, the unit returns to the original recording mode.

Note

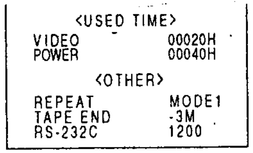
While monitoring the recording condition, recording is interrupted.

1-13. CHECKING THE USED TIME (SVT-1000P)



1 Turn on the power of the equipment to be used.

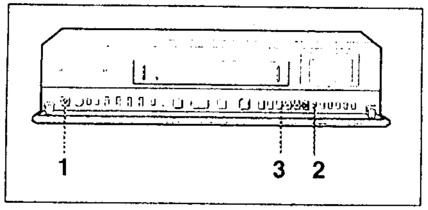
2 Press MENU until the USED TIME display appears on the screen.
VIDEO: shows the amount of time the video head has been used.
POWER: shows the amount of time the power has been on.



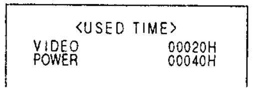
```
      <USED TIME>
VIDEO           00020H
POWER           00040H
        <OTHER>
REPEAT          MODE1
TAPE END        -3M
RS-232C         1200
```

3 Press SEARCH to return to the normal display.

1-14. CHECKING THE USED TIME (SVT-5050P)



1. Turn on the power of the equipment to be used.
2. Press MENU until the USED TIME display appears on the screen.
   VIDEO: shows the amount of time the video head has been used.
   POWER: shows the amount of time the power has been on.



```
<USED TIME>
VIDEO        00020H
POWER        00040H
```

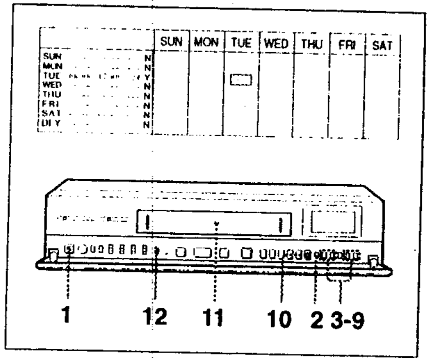
3. Press SEARCH to return to the normal display.

1-15. TIMER RECORDING

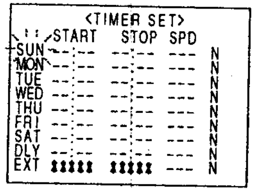
You can set the timer recording in two methods: day of the week recording and daily recording.
Before starting, make sure that the time and date are set properly. (See page 11.)

Day of the Week Recording

Example 1:
Making a recording from 8:00 on Tuesday to 17:00 the same day with the recording speed set to 24-hour mode.

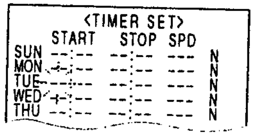


1. Turn on the power of the equipment to be used.
2. Press MENU until the TIMER SET display appears on the screen.



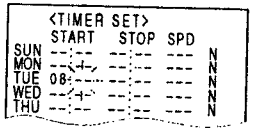
```
        <TIMER SET>
     START   STOP  SPD
SUN  --:--   --:--  ---   N
MON  --:--   --:--  ---   N
TUE  --:--   --:--  ---   N
WED  --:--   --:--  ---   N
THU  --:--   --:--  ---   N
FRI  --:--   --:--  ---   N
SAT  --:--   --:--  ---   N
DLY  --:--   --:--  ---   N
EXT  ::::::  ::::::  ---   N
```

3. Press SHIFT ▼ to move the flashing to TUE and the SHIFT ▶ to move it to the hour position of START.



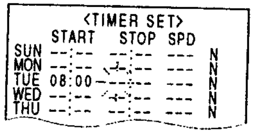
```
      <TIMER SET>
     START   STOP  SPD
SUN  --:--   --:--  ---   N
MON  --:--   --:--  ---   N
TUE  --:--   --:--  ---   N
WED  --:--   --:--  ---   N
THU  --:--   --:--  ---   N
```

4. Set the start hour by pressing REC/PLAY SPEED +/– and press SHIFT ▶.



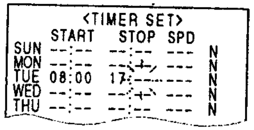
```
      <TIMER SET>
     START   STOP  SPD
SUN  --:--   --:--  ---   N
MON  --:--   --:--  ---   N
TUE  08:--   --:--  ---   N
WED  --:--   --:--  ---   N
THU  --:--   --:--  ---   N
```

5. Set the start minute by pressing REC/PLAY SPEED +/– and press SHIFT ▶.



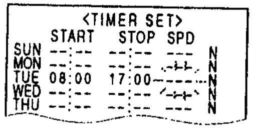
```
      <TIMER SET>
     START   STOP  SPD
SUN  --:--   --:--  ---   N
MON  --:--   --:--  ---   N
TUE  08:00   --:--  ---   N
WED  --:--   --:--  ---   N
THU  --:--   --:--  ---   N
```

6. Set the stop hour by pressing REC/PLAY SPEED +/– and press SHIFT ▶.



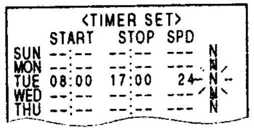
```
      <TIMER SET>
     START   STOP  SPD
SUN  --:--   --:--  ---   N
MON  --:--   --:--  ---   N
TUE  08:00   17:--  ---   N
WED  --:--   --:--  ---   N
THU  --:--   --:--  ---   N
```

7. Set the stop minute by pressing REC/PLAY SPEED +/– and press SHIFT ▶.



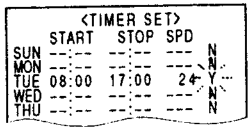
```
      <TIMER SET>
     START   STOP  SPD
SUN  --:--   --:--  ---   N
MON  --:--   --:--  ---   N
TUE  08:00   17:00  ---   N
WED  --:--   --:--  ---   N
THU  --:--   --:--  ---   N
```

8 Set the recording speed by pressing REC/PLAY SPEED +/– and press SHIFT ▶.



```
        <TIMER SET>
     START    STOP  SPD
SUN  --:--   --:--  ---  N
MON  --:--   --:--  ---  N
TUE  08:00   17:00   24  N
WED  --:--   --:--  ---  N
THU  --:--   --:--  ---  N
```

9 Select Y (yes) to execute the timer recording by pressing REC/PLAY SPEED +/–.



```
        <TIMER SET>
     START    STOP  SPD
SUN  --:--   --:--  ---  N
MON  --:--   --:--  ---  N
TUE  08:00   17:00   24  Y
WED  --:--   --:--  ---  N
THU  --:--   --:--  ---  N
```

If you want to preset other settings, repeat steps 3 to 9.

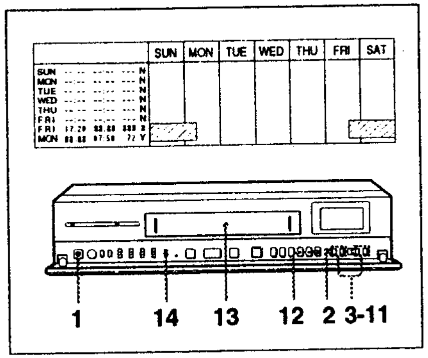
10 When you have completed all the settings, press SEARCH to return to the normal display.

11 Insert the cassette.

12 Set TIMER to ON.
The VCR turns off automatically, and enters the timer recording standby mode. The ⏲ indicator appears in the display window.
When no cassette is inserted. The ⏲ indicator flashes.

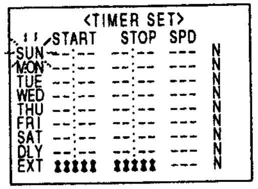
You can set the timer to make a recording for more than 2 days using the 7th and 8th lines on the TIMER SET display .

Example 2:
Making a recording from 17:20 on Friday to 7:50 on Monday with the recording speed set to 72-hour mode.



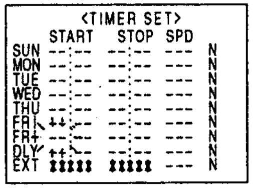
1 Turn on the power of the equipment to be used.

2 Press MENU until the TIMER SET display appears on the screen.



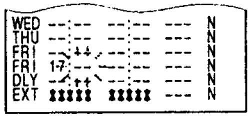
```
        <TIMER SET>
     START    STOP  SPD
SUN  --:--   --:--  ---  N
MON  --:--   --:--  ---  N
TUE  --:--   --:--  ---  N
WED  --:--   --:--  ---  N
THU  --:--   --:--  ---  N
FRI  --:--   --:--  ---  N
SAT  --:--   --:--  ---  N
DLY  --:--   --:--  ---  N
EXT  *****   *****  ---  N
```

3 Press SHIFT ▼ to move the flashing to SAT (7th line), change SAT to FRI by pressing REC/PLAY SPEED +/– and press SHIFT ▶.



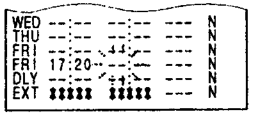
```
        <TIMER SET>
     START    STOP  SPD
SUN  --:--   --:--  ---  N
MON  --:--   --:--  ---  N
TUE  --:--   --:--  ---  N
WED  --:--   --:--  ---  N
THU  --:--   --:--  ---  N
FRI  --:--   --:--  ---  N
FRI  --:--   --:--  ---  N
DLY  --:--   --:--  ---  N
EXT  *****   *****  ---  N
```

4 Set the start hour by pressing REC/PLAY SPEED +/– and press SHIFT ▶.



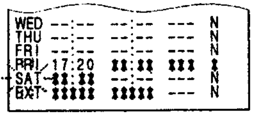
```
WED  --:--   --:--  ---  N
THU  --:--   --:--  ---  N
FRI  --:--   --:--  ---  N
FRI  17:--   --:--  ---  N
DLY  --:--   --:--  ---  N
EXT  *****   *****  ---  N
```

5 Set the start minute by pressing REC/PLAY SPEED +/– and press SHIFT ▶.



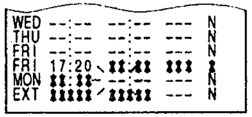
```
WED  --:--   --:--  ---  N
THU  --:--   --:--  ---  N
FRI  --:--   --:--  ---  N
FRI  17:20   --:--  ---  N
DLY  --:--   --:--  ---  N
EXT  *****   *****  ---  N
```

6 Display the ✻ marks on the stop time (STOP), recording speed (SPD) and timer execution positions in the 7th line and on the start time (START) position in the 8th line by pressing REC/PLAY SPEED +/– and press SHIFT ▶.
The day of the week in the 8th line changes to the day after the day in the 7th line.



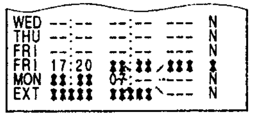
```
WED  --:--   --:--  ---  N
THU  --:--   --:--  ---  N
FRI  --:--   --:--  ---  N
FRI  17:20   **:**  ***  *
SAT  **:**   --:--  ---  N
EXT  *****   *****  ---  N
```

7 Set flashing SAT to MON by pressing REC/PLAY SPEED +/– and press SHIFT ▶ to move the flasing to the hour position of STOP.



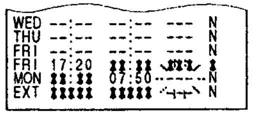
```
WED  --:--   --:--  ---  N
THU  --:--   --:--  ---  N
FRI  --:--   --:--  ---  N
FRI  17:20   **:**  ***  *
MON  **:**   --:--  ---  N
EXT  *****   *****  ---  N
```

8 Set the stop hour by pressing REC/PLAY SPEED +/– and press SHIFT ▶.



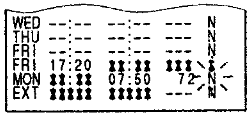
```
WED  --:--   --:--  ---  N
THU  --:--   --:--  ---  N
FRI  --:--   --:--  ---  N
FRI  17:20   **:**  ***  *
MON  **:**   07:--  ---  N
EXT  *****   *****  ---  N
```

9 Set the stop minute by pressing REC/PLAY SPEED +/– and press SHIFT ▶.



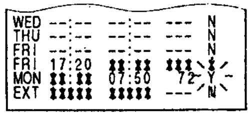
```
WED  --:--   --:--  ---  N
THU  --:--   --:--  ---  N
FRI  --:--   --:--  ---  N
FRI  17:20   **:**  ***  *
MON  **:**   07:50  ---  N
EXT  *****   *****  ---  N
```

10 Set the recording speed by pressing REC/PLAY SPEED +/– and press SHIFT ▶.



```
WED  --:--   --:--  ---  N
THU  --:--   --:--  ---  N
FRI  --:--   --:--  ---  N
FRI  17:20   **:**  ***  *
MON  **:**   07:50   72  N
EXT  *****   *****  ---  N
```

11 Select Y (yes) to execute the timer recording by pressing REC/PLAY SPEED +/–.



```
WED  --:--   --:--  ---  N
THU  --:--   --:--  ---  N
FRI  --:--   --:--  ---  N
FRI  17:20   **:**  ***  *
MON  **:**   07:50   72  Y
EXT  *****   *****  ---  N
```

12 When you have completed all the settings press SEARCH to return to the normal display.

13 Insert the cassette.

14 Set TIMER to ON.
The VCR turns off automatically, and enters the timer recording standby mode. The ⏲ indicator appears in the display window.
When no cassette is inserted. The ⏲ indicator flashes.

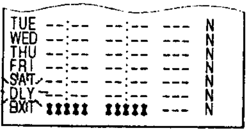
When the ⏲ indicator appears in the display window, the buttons except TIMER does not work.

Daily Recording

You can preset the timer to start recording each day of the week.

1 Move the flashing to the appropriate day of the week by pressing SHIFT ▼.

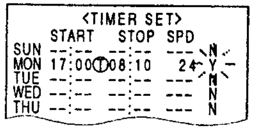
2 Set the day to DLY by pressing REC/PLAY SPEED +/– before setting the hour position of START in step 3.



```
TUE --:--  --:--  ---  N
WED --:--  --:--  ---  N
THU --:--  --:--  ---  N
FRI --:--  --:--  ---  N
SAT --:--  --:--  ---  N
DLY --:--  --:--  ---  N
EXT ‡‡‡‡‡  ‡‡‡‡‡  ---  N
```

When the time set in the STOP section is earlier than the time set in the START section

The STOP time is assumed to be for the next day, and the T (tomorrow) indicator is displayed before the stop time.



```
      <TIMER SET>
    START   STOP  SPD
SUN --:--  --:--  ---  N
MON 17:00Ⓣ08:10   24   Y
TUE --:--  --:--  ---  N
WED --:--  --:--  ---  N
THU --:--  --:--  ---  N
```

Timer recording is interrupted when the power is interrupted

When a period of the power interruption is shorter than the power backup time (within 30 days) and within the timer end time, the recording is resumed after the power is restored.
The P indicator lights in the display window to show that the timer recording is interrupted. (To clear the P indicator, press MENU RESET on the front panel. See page 16.)

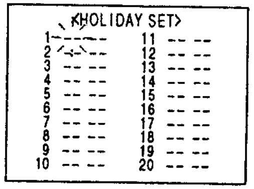
To stop the timer recording

Set TIMER to OFF. The recording stops and the power is turned off.

Setting the Holiday

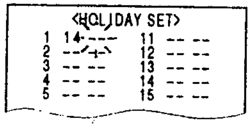
If you enter dates for holidays, the VCR will assume that these dates are Sundays and will record at the same time you set for Sundays.

1 Press MENU until the HOLIDAY SET display appears on the screen.



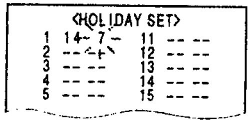
```
   <HOLIDAY SET>
 1 -- --    11 -- --
 2 -- --    12 -- --
 3 -- --    13 -- --
 4 -- --    14 -- --
 5 -- --    15 -- --
 6 -- --    16 -- --
 7 -- --    17 -- --
 8 -- --    18 -- --
 9 -- --    19 -- --
10 -- --    20 -- --
```

2 Set the day of the holiday you want by pressing REC/PLAY SPEED+/– and press SHIFT ▶.



```
   <HOLIDAY SET>
 1 14 --    11 -- --
 2 -- --    12 -- --
 3 -- --    13 -- --
 4 -- --    14 -- --
 5 -- --    15 -- --
```

3 Set the month of the holiday by pressing REC/PLAY SPEED+/–.



```
   <HOLIDAY SET>
 1 14  7    11 -- --
 2 -- --    12 -- --
 3 -- --    13 -- --
 4 -- --    14 -- --
 5 -- --    15 -- --
```

To set other holidays, press SHIFT ▼ ▶ to move to the next row.

4 When you have completed all the settings, press SEARCH to return to the normal display.

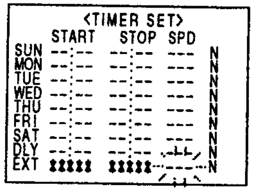
Recording Using an External Timer

You can preset the time to start and end recording by using a timer connected to the EXT TIMER terminal on the rear of the unit. Set the recording speed on the TIMER SET display on screen.

1 Turn on the power of the equipment to be used.

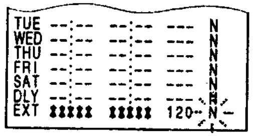
2 Press MENU until the TIMER SET display appears on the screen.

3 Press SHIFT ▼ to move the flashing to EXT (lowest line) and press SHIFT ▶.



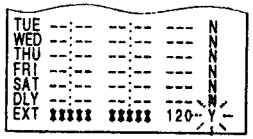
```
      <TIMER SET>
    START   STOP  SPD
SUN --:--  --:--  ---  N
MON --:--  --:--  ---  N
TUE --:--  --:--  ---  N
WED --:--  --:--  ---  N
THU --:--  --:--  ---  N
FRI --:--  --:--  ---  N
SAT --:--  --:--  ---  N
DLY --:--  --:--  ---  N
EXT ‡‡‡‡‡  ‡‡‡‡‡  ---  N
```

4 Set the recording speed by pressing REC/PLAY SPEED +/– and press SHIFT ▶.



```
TUE --:--  --:--  ---  N
WED --:--  --:--  ---  N
THU --:--  --:--  ---  N
FRI --:--  --:--  ---  N
SAT --:--  --:--  ---  N
DLY --:--  --:--  ---  N
EXT ‡‡‡‡‡  ‡‡‡‡‡  120  N
```

5 Select Y (yes) to execute the timer recording by pressing REC/PLAY SPEED +/–.



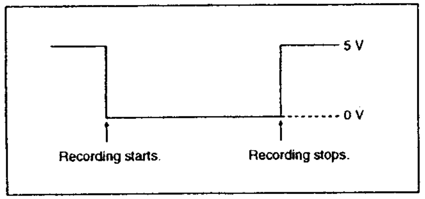
```
TUE --:--  --:--  ---  N
WED --:--  --:--  ---  N
THU --:--  --:--  ---  N
FRI --:--  --:--  ---  N
SAT --:--  --:--  ---  N
DLY --:--  --:--  ---  N
EXT ‡‡‡‡‡  ‡‡‡‡‡  120  Y
```

6 When you have completed all the settings, press SEARCH to return to the normal display.

7 Insert the cassette.

8 Set TIMER to ON.

Input signal from the EXT TIMER terminal



Changing/Cancelling the Timer Settings

When ⏲ indicator lights in the display window, set TIMER to OFF to clear it.

Changing the timer settings

1. Press MENU until the TIMER SET display appears on the screen.
2. Press SHIFT ▶ or ▼ to move the flashing to the position where you want to change.
3. Press REC/PLAY SPEED +/– to change the setting.
4. Press SEARCH to return to the normal display.

Cancelling the timer setting

1. Press MENU until the TIMER SET display appears on the screen.
2. Press SHIFT ▼ to move the flashing to the position where you want to cancel.
3. Press SHIFT ▶ to move the flashing to the timer execution.
4. Press REC/PLAY SPEED +/– to set the timer execution to N.
5. Press SEARCH to return to the normal display.

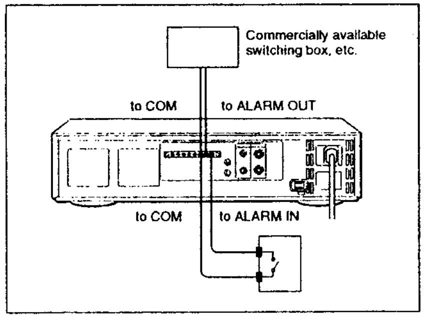
Cancelling all timer settings

1. Press MENU until the TIMER SET display appears on the screen.
2. Press MENU RESET.

1-16. ALARM RECORDING (SVT-1000P)

You can use a door switch or alarm sensor to trigger alarm recording. You can make alarm recording in recording mode, stop mode, power off mode and one-shot recording mode with the selected recording speed.

Connecting an Alarm Sensor



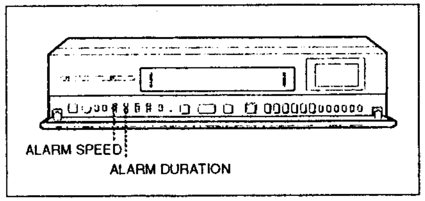
Setting the Alarm Speed and Duration

You can set ALARM SPEED as follows:

3H: for recording in 3-hour mode
12H: for recording in 12-hour mode
NC: for recording at the same speed as before the alarm was

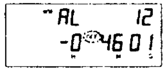
You can set ALARM DURATION as otllows:

20S: for recording for 20 seconds
1M: for recording for one minute
CC: for recording as long as the alarm signal is being input (or for at least five seconds)



Notes

- While alarm recording is in progress, other modes are inoperable.
- After the alarm recording is completed, the VCR returns to the condition it was in before the alarm signal was received.
- If an alarm input is received while the VCR is in repeat recording (see page 16), repeat recording stops and the REPEAT indicator goes off. After the tape reaches the end, the tape is rewound and the VCR stops. The OFF indicator lights in the display window.

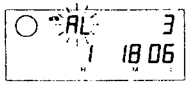


When the OFF indicator lights, in order to prevent accidental erasure of a recorded tape, timer recording and alarm recording cannot be executed.
If any of ● REC, ▶▶ FF, ◀◀ REW, ▶ PLAY is pressed, the OFF indicator goes off.

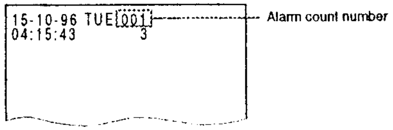
- If another alarm is received while alarm recording is in progress, the second alarm recording starts and the recording duration is extended.
- If the power is interrupted while alarm recording is in progress and restored again, the operation before the alarm recording was made resumes.

Indicators during alarm recording

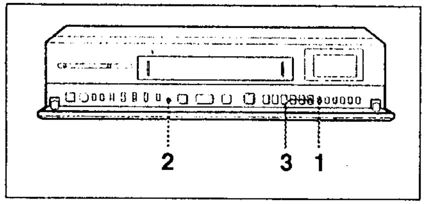
The AL indicator flashes in the display window.



The count (left digit) of the alarm recording flashes on the monitor screen.
The alarm recording can be counted up to 999.
When the alarm function has worked 1000 times, the count number returns to 000.



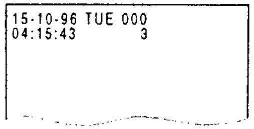
To Reset the Alarm Count



1 Press MENU until the ALARM TIME display appears.

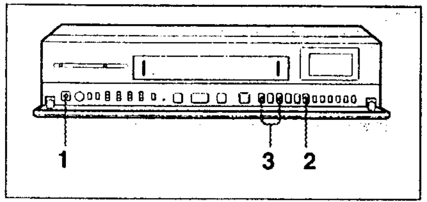
2 Press MENU RESET.

3 Press SEARCH to return to the normal display.
The count on the screen are reset to 000.



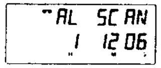
```
15-10-96 TUE 000
04:15:43       3
```

Scanning the Picture of the Alarm Recordings — Alarm Scan

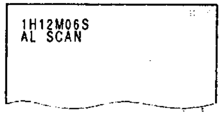


1 Turn on the power of the equipment to be used.

2 Press SEARCH in stop mode.
The AL SCAN lights in the display window and on the monitor screen.



In the display window



```
1H12M06S
AL SCAN
```

On the monitor screen

3 Press ▶▶ FF or ◀◀ REW.
The portions where the alarm function worked are subsequently played back for five seconds one by one.

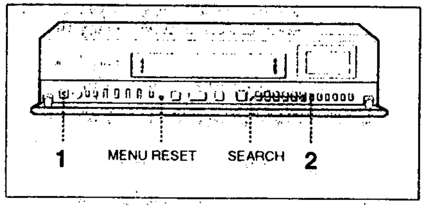
Press ❚❚ PAUSE to view a certain scene in still mode. (Alarm scan mode is released.)

Press ■ STOP, ▶ PLAY, ▶▶ FF, or ◀◀ REW to release alarm scan mode.

Note

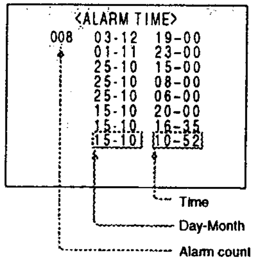
If the tape reaches the end during scanning, the tape is rewound and the unit enters the stop mode at the beginning of the tape.

Displaying the Alarm List — Alarm Recall



1 Turn on the power of the equipment to be used.

2 Press MENU until the ALARM TIME display appears on the screen.
The alarm count, date and time are displayed.
The date and time are displayed up to recent eight times.



```
<ALARM TIME>
008  03-12  19-00
     01-11  23-00
     25-10  15-00
     25-10  08-00
     25-10  06-00
     15-10  20-00
     15-10  16-35
     15-10  10-52
```

To turn off the alarm list on the screen

Press SEARCH. The normal display appears.

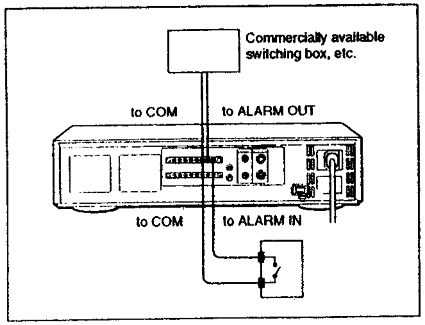
To reset the alarm data

Press MENU RESET while the ALARM TIME display is on the screen.
The alarm count shows "000".

1-17. ALARM RECORDING (SVT-5050P)

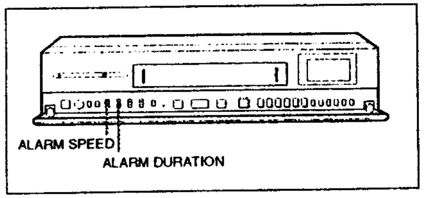
You can use a door switch or alarm sensor to trigger alarm recording. You can make alarm recording in recording mode, stop mode, power off mode and one-shot recording mode with the selected recording speed.

Connecting an Alarm Sensor



Setting the Alarm Speed and Duration

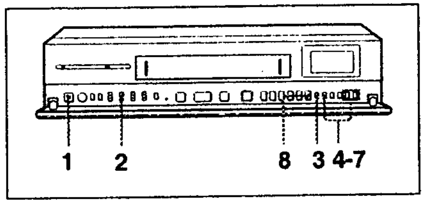
Setting with ALARM SPEED and ALARM DURATION on This Unit



1 Set ALARM SPEED to 3H, 12H or NC.
3H: for recording in 3-hour mode
12H: for recording in 12-hour mode
NC: for recording at the same speed as before the alarm was received.

2 Set ALARM DURATION to 20S, PROG (program) or CC.
20S: for recording for 20 seconds
PROG: for recording for the duration set on the monitor
CC: for recording as long as the alarm signal is being input

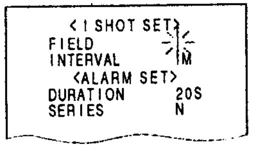
Setting the Alarm Duration on the Monitor



1 Turn on the power of the equipment to be used.

2 Set ALARM DURATION to PROG.

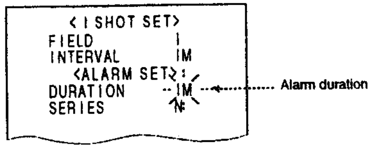
3 Press MENU until the ALARM SET display appears on the screen.



```
  < I SHOT SET>
FIELD           I
INTERVAL        IM
   <ALARM SET>
DURATION        20S
SERIES          N
```

4 Press SHIFT ▼ to move the flashing to DURATION.

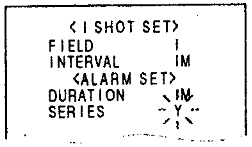
5 Set the alarm duration by pressing REC/PLAY SPEED +/–.
You can set the alarm duration to 20S, 40S, 1M, 2M, 3M, 4M, 5M or CC.



```
  < I SHOT SET>
FIELD           I
INTERVAL        IM
   <ALARM SET>
DURATION        IM
SERIES          N
```

6 Press SHIFT ▼ to move the flashing to SERIES.

7 Set in which mode the alarm recording begins by pressing REC/PLAY SPEED +/–.
Y (yes): accepts alarms only in recording mode. When the VCR is in seriers recording (see page 16), set to Y.
N (no): accepts alarm in recording mode, stop mode, power off mode or one-shot recording mode.

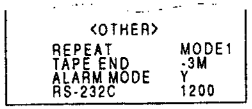


```
  < I SHOT SET>
FIELD           I
INTERVAL        IM
   <ALARM SET>
DURATION        IM
SERIES          Y
```

8 Press SEARCH to return to the normal display.

Setting the Alarm Recording Mode

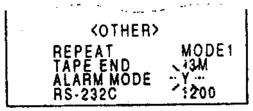
1 Press MENU until the OTHER display appears on the screen.



```
      <OTHER>
REPEAT          MODE1
TAPE END        -3M
ALARM MODE      Y
RS-232C         1200
```

2 Press SHIFT ▼ to move the flashing to ALARM MODE.

3 Set ALARM MODE to Y, Y1, Y2 or N by pressing REC/PLAY SPEED +/–.
Y (yes): accepts alarms and starts recording whenever an alarm signal is received.
Y1: accepts alarms and starts recording only in timer recording mode.
Y2: accepts alarms and starts recording except in timer recording mode.
N (no): does not accept alarm even if an alarm signal is received.

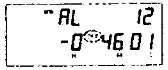


```
      <OTHER>
REPEAT          MODE1
TAPE END        -3M
ALARM MODE      Y
RS-232C         1200
```

4 Press SEARCH to return to the normal display.

Notes

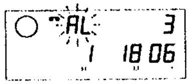
- While alarm recording is in progress, other modes are inoperable.
- After the alarm recording is completed, the VCR returns to the condition it was in before the alarm signal was received.
- If an alarm signal is received while the VCR is in repeat recording (see page 16), repeat recording stops and the REPEAT indicator goes off. After the tape reaches the end, the tape is rewound and the VCR stops. The OFF indicator lights in the display window.



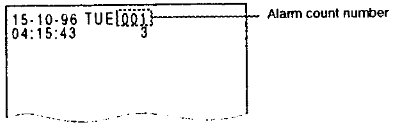
When the OFF indicator lights, in order to prevent accidental erasure of a recorded tape, timer recording and alarm recording cannot be executed.
If any of ● REC, ►► FF, ◄◄ REW, ► PLAY is pressed, the OFF indicator goes off.
- If another alarm is received while alarm recording is in progress, the second alarm recording starts and the recording duration is extended.
- If the power is interrupted while alarm recording is in progress and restored again, the operation before the alarm recording was made resumes.

Indicators during alarm recording

The AL indicator flashes in the display window.

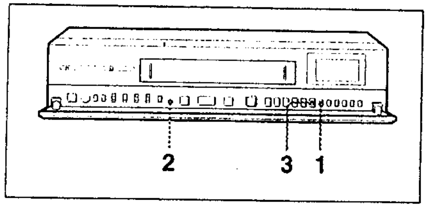


The count (left digit) of the alarm recording flashes on the monitor screen.
The alarm recording can be counted up to 999.
When the alarm function has worked 1000 times, the count number returns to 000.



```
15-10-96 TUE[001]
04:15:43        3
```

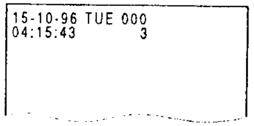
To Reset the Alarm Count



1 Press MENU until the ALARM TIME display appears on the screen.

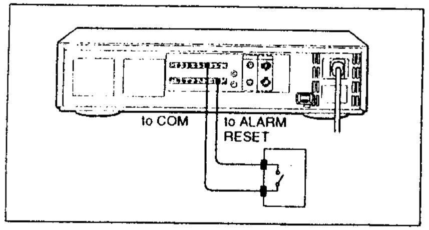
2 Press MENU RESET.

3 Press SEARCH to return to the normal display. The count on the screen are reset to 000.



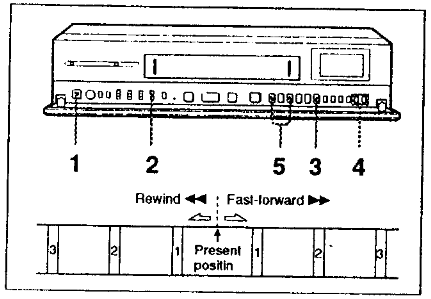
```
15-10-96 TUE 000
04:15:43       3
```

To Stop the Alarm Recording



Short-circuit the ALARM RESET and COM terminals during alarm recording.
When the short-circuiting is released and the alarm signal is received, the alarm recording is started again.

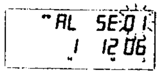
Searching the Picture of the Alarm Recordings — Alarm Search



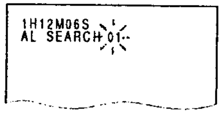
1 Turn on the power of the equipment to be used.

2 Set ON-SCREEN to ON.

3 Press SEARCH in stop mode.
The alarm search indicator flashes in the display window and on the screen.



In the display window



```
1H12M06S
AL SEARCH 01
```

On the monitor

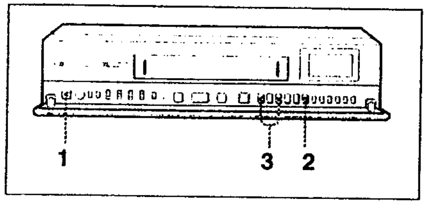
4 Press REC/PLAY SPEED +/– to set the alarm search number (1 to 99).

5 Press ▶▶ FF or ◀◀ REW.
The cassette stops at the portion where the alarm function worked and the still picture playback is displayed.
The alarm search mode is automatically cleared.

Note

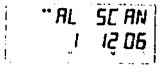
If the tape is reached the end during searching, the tape is rewound and the unit enters the stop mode at the beginning of the tape.

Scanning the Picture of the Alarm Recordings — Alarm Scan

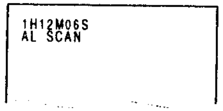


1 Turn on the power of the equipment to be used.

2 Press SEARCH twice in stop mode.
The AL SCAN lights in the display window or on the monitor screen.



In the display window



```
1H12M06S
AL SCAN
```

On the monitor screen

3 Press ▶▶ FF or ◀◀ REW.
The portions where the alarm function worked are subsequently played back for five seconds one by one.

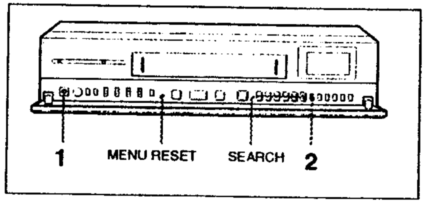
Press ❚❚ PAUSE to view a certain scene in still mode. (Alarm scan mode is released.)

Press ■ STOP, ▶ PLAY, ▶▶ FF, or ◀◀ REW to release alarm scan mode.

Note

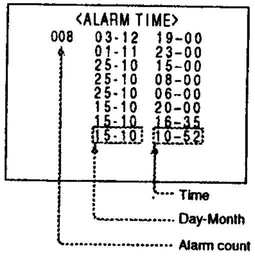
If the tape reaches the end during scanning, the tape is rewound and the unit enters the stop mode at the beginning of the tape.

Displaying the Alarm List — Alarm Recall



1 Turn on the power of the equipment to be used.

2 Press MENU until the ALARM TIME display appears on the screen.
The alarm count, date and time are displayed.
The date and time are displayed up to recent eight times.



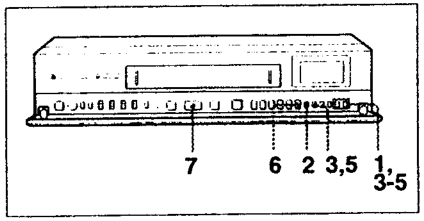
```
     <ALARM TIME>
008   03-12  19-00
      01-11  23-00
      25-10  15-00
      25-10  08-00
      25-10  06-00
      15-10  20-00
      15-10  16-35
      15-10  10-52
```

To turn off the alarm list on the screen
Press SEARCH. The normal display appears.

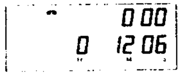
To reset the alarm data
Press MENU RESET while the ALARM TIME display is on the screen.
The alarm count shows "000".

1-18. ONE-SHOT RECORDING (SVT-5050P ONLY)

Aside from long-term recording in time-lapse mode, this unit is capable of one-shot recording, which has applications with data files and animation.

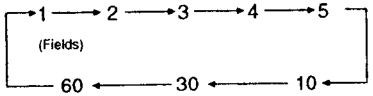


1 Set the recording speed in this display window to "000" by pressing REC/PLAY SPEED +/–.

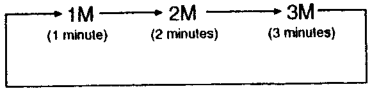


2 Press MENU until the 1 SHOT SET display appears on the screen.

3 Press REC/PLAY SPEED+/– to specify FIELD (the number of fields) to be recorded during one-shot recording and then press SHIFT ▼.

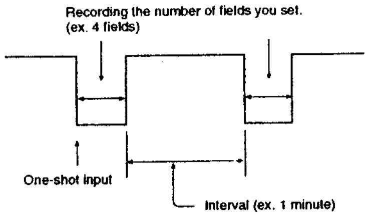

1
2
3
4
5
(Fields)
60
30
10

4 Press REC/PLAY SPEED+/– to set the one-shot time in INTERVAL.

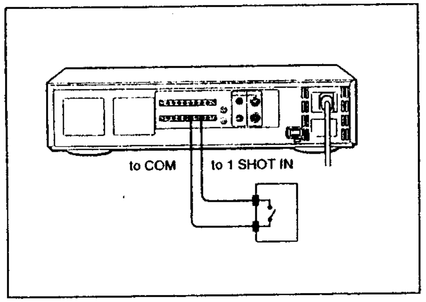

1M
2M
3M
(1 minute)
(2 minutes)
(3 minutes)

5 Press SEARCH to return to the normal display.

6 Press ● REC.
The unit enters the recording pause mode. After the interval to be set passes, one-shot recording starts.

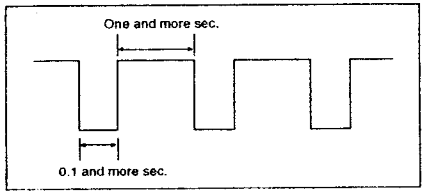

Recording the number of fields you set.
(ex. 4 fields)
One-shot input
Interval (ex. 1 minute)

To start one-shot recording immediately
Press ● REC again or short-circuit the 1 SHOT IN and COM terminals


to COM
to 1 SHOT IN

To set the desired interval for one-shot recording
When you short-circuit the 1 SHOT IN and COM terminals, you can set the desired interval up to three minutes. (However, the number of fields specified in step 3 is recorded.)
In step 4 of the operations, set INTERVAL to the same and longer interval than the one made by short-circuiting 1 SHOT IN and COM terminals.
In step 6, short-circuit the 1 SHOT IN and COM terminals after you have pressed ● REC to start recording.

Notes on use 1 SHOT IN and COM terminals
- 0.1 and more sec. are required when the switch is turned on and one and more sec. is required for the one-shot interval.

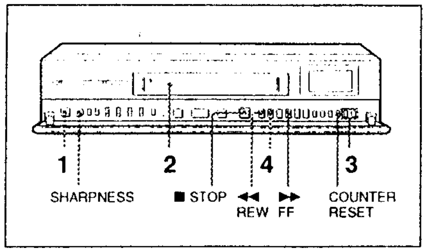

One and more sec.
0.1 and more sec.

- If a one-shot recording input is not received from terminals, one-shot recording is performed according to the settings on the 1 SHOT SET screen.

To stop the one-shot recording
Press ■ STOP.

If an alarm input is received while one-shot recording is in progress
The alarm recording can be performed.
The alarm recording speed is automatically set to the 3-hour mode.

1-19. PLAYBACK (SVT-1000P)



1 Turn on the power of the equipment to be used.

2 Insert the cassette.

3 Select the playback speed by pressing REC/PLAY SPEED -/+.
The selected playback speed is displayed in the display window.

4 Press ▶ PLAY.
Playback starts.

To stop playback

Press ■ STOP.

To rewind the tape

Press ■ STOP and then ◀◀ REW.

To fast-forward the tape

Press ■ STOP and then ▶▶ FF.

To adjust the sharpness of the picture

Turn SHARPNESS to SHARP for a sharper picture or to SOFT for a softer picture.

Resetting the tape counter

The tape counter in the display window helps you to locate a certain scene after playback. Press COUNTER RESET to set the counter to "0H00M00S" (counter zero) position before playing back the tape. The VCR keeps counting the length of the tape being played back. Note, however, that the tape counter will not count the portions without video signals.

Note

You cannot play back the tapes recorded on other time-lapse VCR on this VCR and vice versa.

Audio Playback

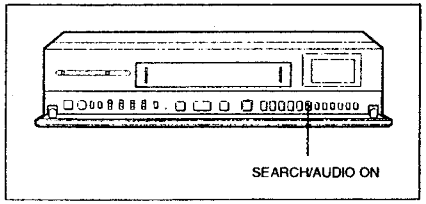
You can play back the sound with the picture if a tape is recorded in 3-, 12-, or 24-hour mode.
Play back the tape at the same speed at which it was recorded so that you can monitor the sound normally.

For audio playback in 3-hour mode

Play back the tape normally.

For audio playback in 12-hour or 24-hour mode

Press SEARCH/AUDIO ON in playback mode.
"A12" or "A24" is displayed in the display window.
To turn off the sound, press SEARCH/AUDIO ON again.



Note

Noise appears on the screen and the sound is distorted when you play back the picture in 12- or 24-hour mode.

Playback speed

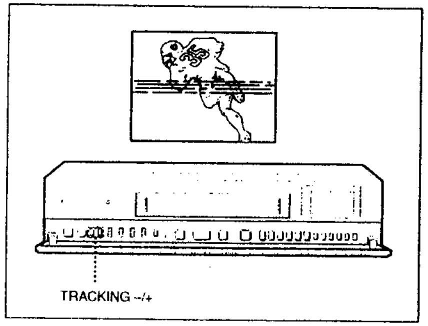
You can view the playback picture at one of the following speeds.

Recording speed(H)	Playback speed (H)				
	3	12	24	48	72
3	1	1/4	1/8	1/16	1/24
12	4	1	1/2	1/4	1/6
24	8	2	1	1/2	1/3
48	16	4	2	1	2/3
72	24	6	3	3/2	1

For example, when a tape recorded in 24-hour mode is played back in 3-hour mode, you can view the playback picture at a speed 8 times faster than the recorded one.

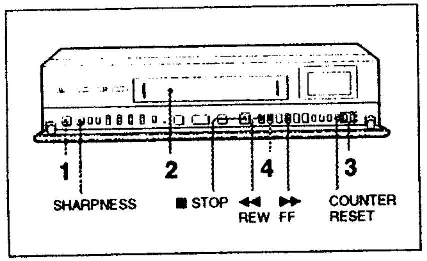
Adjusting Pictures

If streaks or noise bands appear on the playback picture, adjust the tracking condition.



Use TRACKING -/+.

1-20. PLAYBACK (SVT-5050P)



1. Turn on the power of the equipment to be used.
2. Insert the cassette.
3. Select the playback speed by pressing REC/PLAY SPEED –/+.
   The selected playback speed is displayed in the display window.
4. Press ▶ PLAY.
   Playback starts.

To stop playback
Press ■ STOP.

To rewind the tape
Press ■ STOP and then ◀◀ REW.

To fast-forward the tape
Press ■ STOP and then ▶▶ FF.

To adjust the sharpness of the picture
Turn SHARPNESS to SHARP for a sharper picture or to SOFT for a softer picture.

Resetting the tape counter
The tape counter in the display window helps you to locate a certain scene after playback. Press COUNTER RESET to set the counter to "0H00M00S" (counter zero) position before playing back the tape. The VCR keeps counting the length of the tape being played back. Note, however, that the tape counter will not count the portions without video signals.

Note
You cannot play back the tapes recorded on other time-lapse VCR on this VCR and vice versa.

Audio Playback

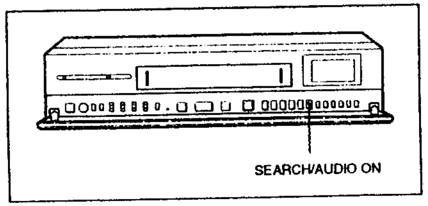
You can play back the sound with the picture if a tape is recorded in 3-, 12-, or 24-hour mode.
Play back the tape at the same speed at which it was recorded so that you can monitor the sound normally.

For audio playback in 3-hour mode

Play back the tape normally.

For audio playback in 12-hour or 24-hour mode

Press SEARCH/AUDIO ON in playback mode.
"A12" or "A24" is displayed in the display window.
To turn off the sound, press SEARCH/AUDIO ON again.



Note
Noise appears on the screen and the sound is distorted when you play back the picture in 12- or 24-hour mode.

Playback speed

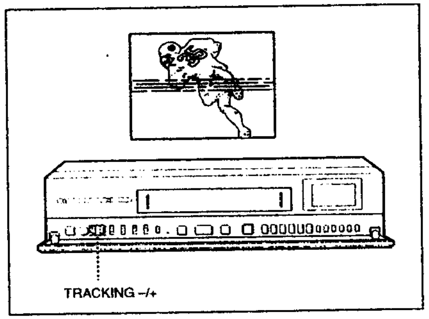
You can view the playback picture at one of the following speeds.

Recording speed(H)	Playback speed (H)												
	3	12	24	48	72	96	120	168	240	360	480	720	960
3	1	1/4	1/8	1/16	1/24	1/32	1/40	1/56	1/80	1/120	1/160	1/240	1/320
12	4	1	1/2	1/4	1/6	1/8	1/10	1/14	1/20	1/30	1/40	1/60	1/80
24	8	2	1	1/2	1/3	1/4	1/5	1/7	1/10	1/15	1/20	1/30	1/40
48	16	4	2	1	2/3	1/2	2/5	2/7	1/5	2/15	1/10	1/15	1/20
72	24	6	3	3/2	1	3/4	3/5	3/7	3/10	1/5	3/20	1/10	3/40
96	32	8	4	2	4/3	1	4/5	4/7	2/5	4/15	1/5	2/15	1/10
120	40	10	5	5/2	5/3	5/4	1	5/7	1/2	1/3	1/4	1/6	1/8
168	56	14	7	7/2	7/3	7/4	7/5	1	7/10	7/15	7/20	7/30	7/40
240	80	20	10	5	10/3	5/2	2	10/7	1	2/3	1/2	1/3	1/4
360	120	30	15	15/2	5	15/4	3	15/7	3/2	1	3/4	1/2	3/8
480	160	40	20	10	20/3	5	4	20/7	2	4/3	1	2/3	1/2
720	240	60	30	15	10	15/2	6	30/7	3	2	3/2	1	3/4
960	320	80	40	20	40/3	10	8	40/7	4	8/3	2	4/3	1

For example, when a tape recorded in 120-hour mode is played back in 12-hour mode, you can view the playback picture at a speed 10 times faster than the recorded one.

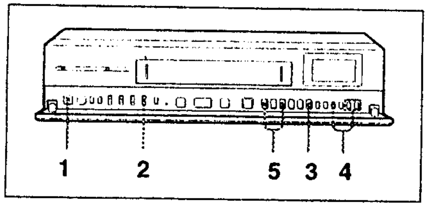
Adjusting Pictures

If streaks or noise bands appear on the playback picture, adjust the tracking condition.



Use TRACKING –/+.

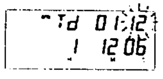
1-21. SEARCHING THE TIME AND DATA–TIME/DATA SEARCH (SVT-5050P)



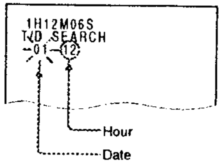
1 Turn on the power of the equipment to be used.

2 Set ON-SCREEN to ON.

3 Press SEARCH three times in stop mode.
The time/date search indicator flashes in the display window and on the monitor screen.



In the display window



On the monitor

4 Press REC/PLAY SPEED +/– to set the date and press SHIFT ▶ to move the flashing to the time.
Press + or – to set the time.

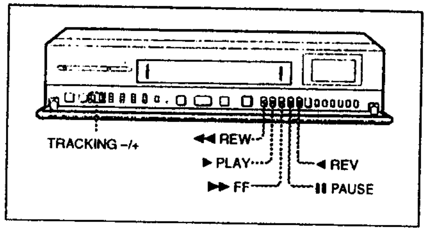
5 Press ▶▶ FF or ◀◀ REW.
The cassette stops at the portion when you set the time and date and the still picture playback is displayed.
The time/date search mode is automatically cleared.

Notes

- The time/date function works in 12 to 960 hours recording speed mode.
- If the tape is reached at its end during searching, the tape is rewound and the unit enters the stop mode at the beginning of the tape.

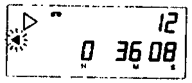
1-22. VARIOUS PLAYBACK MODE

You can play back picture at various modes: reverse playback, still and field by field pictures, and high-speed playback in both forward and reverse directions.



Reverse Playback

During playback, keep pressing ◀ REV. Reverse playback picture appears on the screen.



In the display window

Note

During reverse playback, streaks appear on the monitor screen.

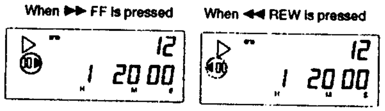
Still Picture

During playback, press ❚❚ PAUSE.
To resume normal playback, press ❚❚ PAUSE or ▶ PLAY.
When the still mode lasts for more than about five minutes, the VCR will automatically enter the playback mode.

If the picture shakes while in the still mode
Adjust the picture with TRACKING –/+.

Field-by-Field Picture

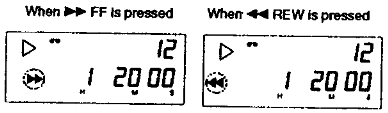
In the still mode, press ▶▶ FF or ◀◀ REW.
Each time you press the button, the picture advances by one field.
When you hold the button down, the picture advances continuously.


When ▶▶ FF is pressed
When ◀◀ REW is pressed

In the display window

Picture Search

During playback, press ▶▶ FF (forward direction) or ◀◀ REW (reverse direction). A high-speed picture (about five times the normal speed in 3-hour mode) without sound appears on the monitor screen.
To resume normal playback, press ▶ PLAY.


When ▶▶ FF is pressed
When ◀◀ REW is pressed

In the display window

Note

During picture search, streaks or noise band appear on the monitor screen.

1-23. MAINTENANCE

We recommend you check the VCR daily to confirm that the VCR works correctly.
When the security lock is in effect, release it before operating.

Perform the following checks before starting to record.

1. Turn on the camera, monitor, and this VCR.
2. Confirm that the picture from the camera appears on the monitor screen.
3. Confirm that the time and date display on the monitor is correct.
4. To check the recording condition of the previous day, rewind the tape for a few seconds and play back the tape.
5. Confirm that playback is normal.
6. Confirm that recorded time and date information is correct.

If you find any malfunction, switch all equipment off, unplug the VCR from the AC outlet, and consult your Sony dealer.

Cleaning Video Heads

After prolonged use, the video heads may become contaminated, which results in impaired picture quality (snow) or loss of picture. To avoid this, clean the video heads regularly.

Replacing Video Heads

If optimum picture quality is not restored even after you have cleaned the video heads, head replacement may be necessary. Please consult your Sony dealer.

Checking the Video Heads Every 1000 Hours

A VCR is a high-precision piece of equipment because it records or plays back the picture on a magnetic tape. In particular, the video head and other mechanical parts become dirty or worn. To maintain a clean picture, we recommend maintenance every 1000 hours.
To identify the service time, display the USED TIME screen. (See page 18.)

Maintaining Mechanical Parts

When not used for long periods, the VCR should be switched on now and then set to the playback mode for about three minutes. This helps to prevent mechanical deterioration.

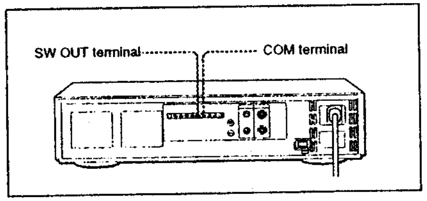
Servicing Periodically

To maintain optimum operating conditions and picture quality, periodic servicing (cleaning, lubrication, parts replacement) is necessary.
Please consult your Sony dealer.
If the VCR is to be used for critical monitoring purposes, it may be preferable to perform servicing at shorter intervals.

1-24. TERMINALS (SVT-1000P)

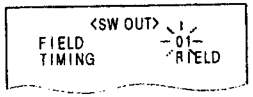
SW OUT Terminal

The VCR outputs a pulse signal from the SW (switch) OUT terminal to the camera switcher to control the switching from camera to camera.



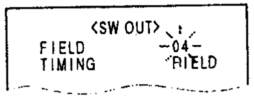
Specify the interval between each pulse signal on the SW OUT display. Also, set TIMING to FIELD or FRAME depending on the specifications of the camera switcher.
Available settings are:
- **FIELD:** 1, 2, 3, 4, 5, 10, 30, or 50 fields
- **FRAME:** 1, 2, 3, 4, 5, 10, 30, or 50 frames

1. Press MENU until the SW OUT display appears on the screen.



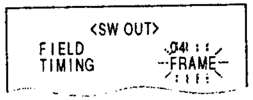
```
        <SW OUT>
FIELD              01
TIMING             FIELD
```

2. Set the interval by pressing REC/PLAY SPEED +/– and press SHIFT ▶.



```
        <SW OUT>
FIELD              04
TIMING             FIELD
```

3. Set TIMING to FIELD or FRAME by pressing REC/PLAY SPEED +/–.

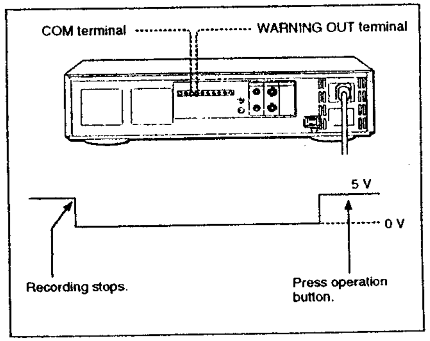


```
        <SW OUT>
FIELD              04
TIMING             FRAME
```

4. When you have completed the settings, press SEARCH to retlurn to the normal display.

WARNING OUT Terminal

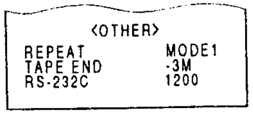
This terminal will help you to know when something wrong has happened to the VCR during recording.
The VCR outputs a signal from WARNING OUT terminal.



RS-232C Interface

When a personal computer is connected via RS-232C interface (SVT-RS1 Computer Interface Board), set the baud rate on the OTHER screen.

1. Press MENU until the OTHER display appears on the screen.



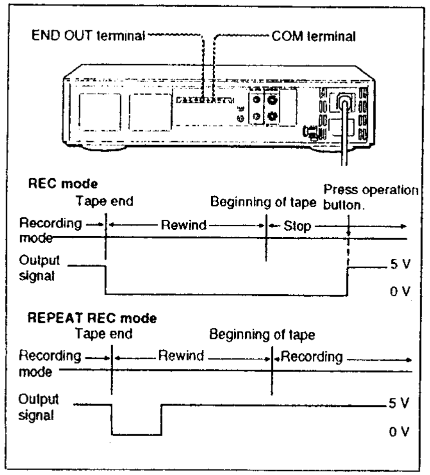
```
        <OTHER>
REPEAT          MODE1
TAPE END        -3M
RS-232C         1200
```

2. Press ▼ SHIFT to move the flashing to RS-232C and set the baud rate (1200, 2400, 4800 or 9600 bps) by pressing REC/PLAY SPEED+/–.
3. Press SEARCH to return to the normal display.

1-25. TERMINALS (SVT-5050P)

END OUT Terminal

When the VCR detects the tape end or the time counter shows "2H57M" during recording, the output level becomes 0 V DC. To resume the 5 V output, press the operation button (● REC, ▶▶ FF, ◀◀ REW or ▶ PLAY).

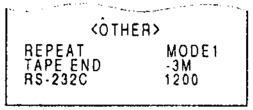


END OUT terminal
COM terminal
REC mode
Tape end
Beginning of tape
Press operation button.
Recording mode
Rewind
Stop
Output signal
5 V
0 V
REPEAT REC mode
Tape end
Beginning of tape
Recording mode
Rewind
Recording
Output signal
5 V
0 V

Select either the tape end or "2H57M" on the OTHER display.

- **–3M:** the time counter shows "2H57" (about three minutes before the tape end, when using E-180 tape) and a signal is output from the END OUT terminal (recording will be continued to the end of the tape).
- **END:** the VCR detects the tape end.

1 Press MENU until the OTHER display appears on the screen.



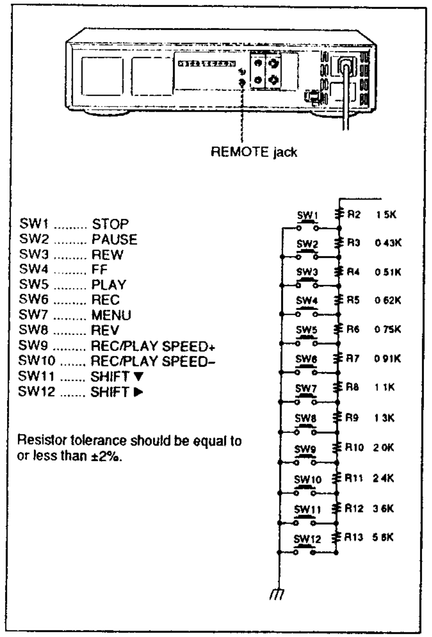
```
<OTHER>
REPEAT        MODE1
TAPE END      -3M
RS-232C       1200
```

2 Press ▼ SHIFT to move the flashing to TAPE END and set to –3M or END by pressing REC/PLAY SPEED +/–.

3 Press SEARCH to return to the normal display.

REMOTE Jack

The VCR can be remotely controlled by adding the circuit shown below to the REMOTE jack.



REMOTE jack
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
SW10
SW11
SW12
R2 1 5K
R3 0 43K
R4 0 51K
R5 0 62K
R6 0 75K
R7 0 91K
R8 1 1K
R9 1 3K
R10 2 0K
R11 2 4K
R12 3 6K
R13 5 6K

SW1	STOP
SW2	PAUSE
SW3	REW
SW4	FF
SW5	PLAY
SW6	REC
SW7	MENU
SW8	REV
SW9	REC/PLAY SPEED+
SW10	REC/PLAY SPEED–
SW11	SHIFT ▼
SW12	SHIFT ▶

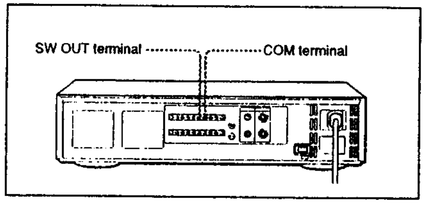
Resistor tolerance should be equal to or less than ±2%.

Note

Use a shielded cord less than 5 m (16 ft.) in length.

SW OUT Terminal

The VCR outputs a pulse signal from the SW (switch) OUT terminal to the camera switcher to control the switching from camera to camera.



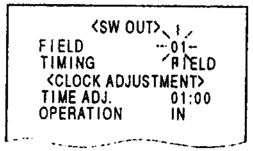
SW OUT terminal
COM terminal

Specify the interval between each pulse signal on the SW OUT display. Also, set TIMING to FIELD or FRAME depending on the specifications of the camera switcher.

Available settings are:

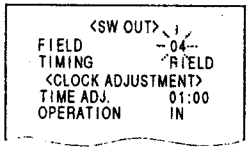
- **FIELD:** 1, 2, 3, 4, 5, 10, 30, or 50 fields
- **FRAME:** 1, 2, 3, 4, 5, 10, 30, or 50 frames

1 Press MENU until the SW OUT display appears on the screen.



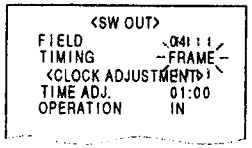
```
<SW OUT>
FIELD           01
TIMING          FIELD
 <CLOCK ADJUSTMENT>
TIME ADJ.       01:00
OPERATION       IN
```

2 Set the interval by pressing REC/PLAY SPEED +/– and press SHIFT ▶.



```
<SW OUT>
FIELD           04
TIMING          FIELD
 <CLOCK ADJUSTMENT>
TIME ADJ.       01:00
OPERATION       IN
```

3 Set TIMING to FIELD or FRAME by pressing REC/PLAY SPEED +/–.

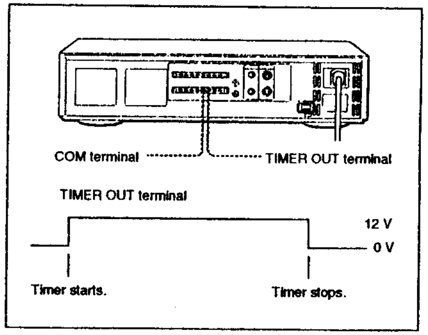


```
<SW OUT>
FIELD           04
TIMING          FRAME
 <CLOCK ADJUSTMENT>
TIME ADJ.       01:00
OPERATION       IN
```

4 When you have completed the settings, press SEARCH to return to the normal display.

TIMER OUT Terminal

The VCR outputs +12 V from the TIMER OUT terminal according to the timer setting on the TIMER SET display. The terminal outputs the signal even if the timer recording mode is off (the TIMER switch is set to OFF).



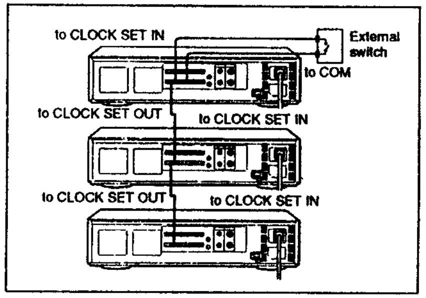
COM terminal
TIMER OUT terminal
TIMER OUT terminal
12 V
0 V
Timer starts.
Timer stops.

CLOCK SET IN/OUT Terminals

You can set the clock of this unit using an external switch.

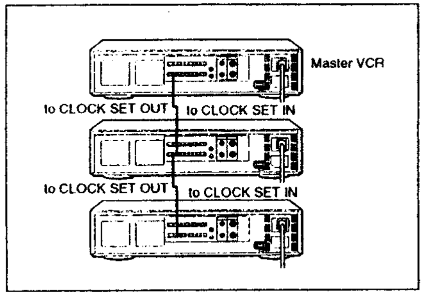
When you use one unit as the master VCR, you can set the clock of the units connected to the master VCR using the master VCR.

When Using an External Switch

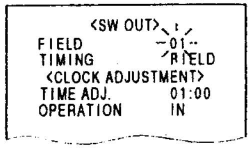


to CLOCK SET IN
External switch
to COM
to CLOCK SET OUT
to CLOCK SET IN
to CLOCK SET OUT
to CLOCK SET IN

When Using One Unit as a Master VCR


Master VCR
to CLOCK SET OUT
to CLOCK SET IN
to CLOCK SET OUT
to CLOCK SET IN

1 Press MENU until the SW OUT/CLOCK ADJUSTMENT display appears on the screen.



```
      <SW OUT>
FIELD             -01-
TIMING            FIELD
 <CLOCK ADJUSTMENT>
TIME ADJ.         01:00
OPERATION         IN
```

2 Press ▼ SHIFT to move the flashing to TIME ADJ. and set the time for clock setting by pressing REC/PLAY SPEED +/–.

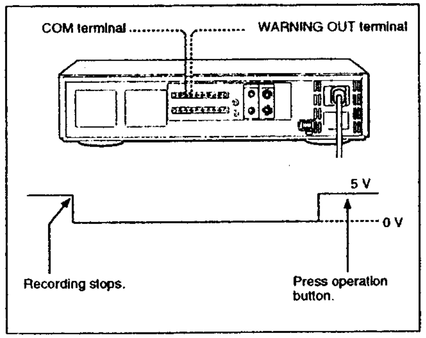
3 Press ▼ SHIFT to move the flashing to OPERATION and set to IN or OUT by pressing REC/PLAY SPEED +/–.
OUT: for the VCR to be used as the master VCR.
IN: for other VCRs.

4 Press SEARCH to return to the normal display.

5 **When using an external switch:**
When you turn the switch on and an input signal is received at the CLOCK SET IN terminal, the clocks of all the connected VCRs will be set to the time adjusted in step 2.
When using one unit as the master VCR:
When the clock of the master VCR comes to the time adjusted in step 2, the signal will be output from the CLOCK SET OUT terminal to set the clocks of the other connected VCRs.

WARNING OUT Terminal

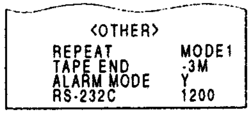
This terminal will help you to know when something wrong has happened to the VCR during recording. The VCR outputs a signal from WARNING OUT terminal.


COM terminal
WARNING OUT terminal
5 V
0 V
Recording stops.
Press operation button.

RS-232C Interface

When a personal computer is connected via RS-232C interface (SVT-RS1 Computer Interface Board), set the baud rate on the OTHER screen.

1 Press MENU until the OTHER display appears on the screen.



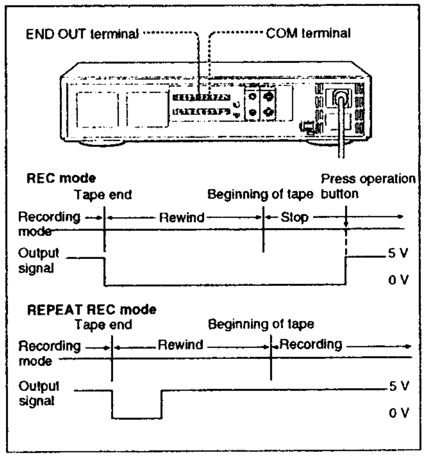
```
     <OTHER>
REPEAT        MODE1
TAPE END      -3M
ALARM MODE    Y
RS-232C       1200
```

2 Press ▼ SHIFT to move the flashing to RS-232C and set the baud rate (1200, 2400, 4800 or 9600 bps) by pressing REC/PLAY SPEED+/–.

3 Press SEARCH to return to the normal display.

END OUT Terminal

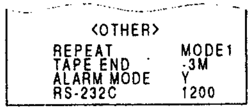
When the VCR detects the tape end or the time counter shows "2H57M" during recording, the output level becomes 0 V DC. To resume the 5 V output, press the operation button (● REC, ▶▶ FF, ◀◀ REW or ▶ PLAY, etc.).


END OUT terminal
COM terminal
REC mode
Tape end
Beginning of tape
Press operation button
Recording mode
Rewind
Stop
Output signal
5 V
0 V
REPEAT REC mode
Tape end
Beginning of tape
Recording mode
Rewind
Recording
Output signal
5 V
0 V

Select either the tape end or "2H57M" on the OTHER display.

- **–3M:** the time counter shows "2H57" (three minutes before the tape end when using E-180 tape) and a signal is output from the END OUT terminal (recording will be continued to the end of the tape).
- **END:** the VCR detects the tape end.

1 Press MENU until the OTHER display appears on the screen.



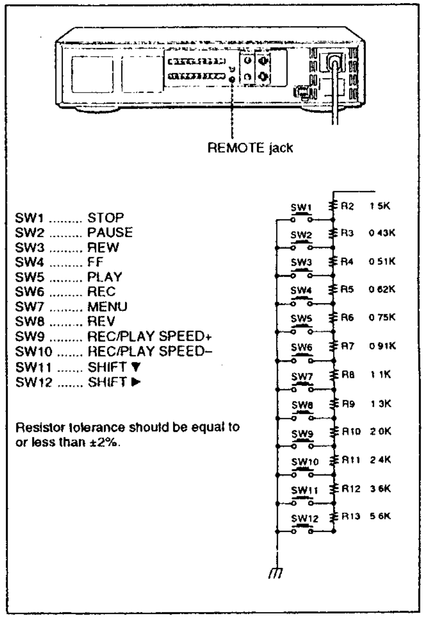
```
     <OTHER>
REPEAT        MODE1
TAPE END      -3M
ALARM MODE    Y
RS-232C       1200
```

2 Press ▼ SHIFT to move the flashing to TAPE END and set to -3M or END by pressing REC/PLAY SPEED +/–.

3 Press SEARCH to return to the normal display.

REMOTE Jack

The VCR can be remotely controlled by adding the circuit shown below to the REMOTE jack.


REMOTE jack
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
SW10
SW11
SW12
R2 1.5K
R3 0.43K
R4 0.51K
R5 0.62K
R6 0.75K
R7 0.91K
R8 1.1K
R9 1.3K
R10 2.0K
R11 2.4K
R12 3.6K
R13 5.6K

SW1 .... STOP
SW2 .... PAUSE
SW3 .... REW
SW4 .... FF
SW5 .... PLAY
SW6 .... REC
SW7 .... MENU
SW8 .... REV
SW9 .... REC/PLAY SPEED+
SW10 .... REC/PLAY SPEED–
SW11 .... SHIFT ▼
SW12 .... SHIFT ▶

Resistor tolerance should be equal to or less than ±2%.

Note

Use a shielded cord less than 5 m (16 ft.) in length.

1-26. TROUBLESHOOTING

This section may help you isolate the problem. Should the problem persist, unplug the unit and contact your Sony dealer or local authorized Sony service facility.

Symptom	Possible cause	Corrective action
The picture does not appear on the monitor screen.	Wrong connection.	Check the connection. (See page 8.)
	No power is provided to video camera and/or monitor TV.	Turn on the power.
The VCR does not respond when you press any button.	No cassette.	Insert a cassette.
	Moisture condensation has occurred.	Leave the VCR until its temperature reaches the room temperature. (See page 16.)
	The VCR is in the alarm recording.	Wait for the alarm recording to finish.
	The security lock function is working.	Release the security lock. (See page 15.)
	The VCR is in timer-recording standby mode or during timer recording.	Set TIMER to OFF.
Recording cannot be done. (The tape ejects automatically.)	The safety tab on the cassette has been removed.	Cover the tab hole with plastic tape. (See page 14.)
Repeat recording cannot be done.	Alarm recording was made during repeat recording.	This is normal.
	REPEAT REC is set to OFF.	Set REPEAT REC to ON. (See page 16.)
Timer recording was not made.	Clock setting is not correct.	Set the clock correctly. (See page 11.)
	TIMER is not set to ON.	Set TIMER to ON. (See page 20.)
Playback picture flickers or blurs.	Video heads are dirty.	Clean the video heads.
Time and date were not recorded.	The time/date display is not displayed.	Set the time/date display. (See page 12.) Set ON-SCREEN to ON. (See page 12.)
The tape does not eject.	System trouble.	Turn the power off and on again to reset the system.
The VCR does not function except to play back the tape.	The power of the equipment to be used is not turned on.	Turn on the power.
The ERROR display appears on the screen.	There is a problem with your unit.	Please contact your Sony dealer.

SECTION 2
DISASSEMBLY

2-1. REMOVAL OF UPPER CASE

It is widen on both sides the back of upper case and remove up direction.

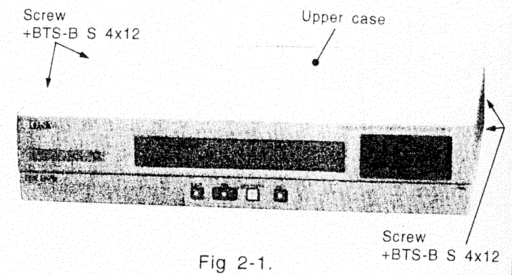

Screw
+BTS-B S 4x12
Upper case
Screw
+BTS-B S 4x12

Fig 2-1.

Then remove the upper case.

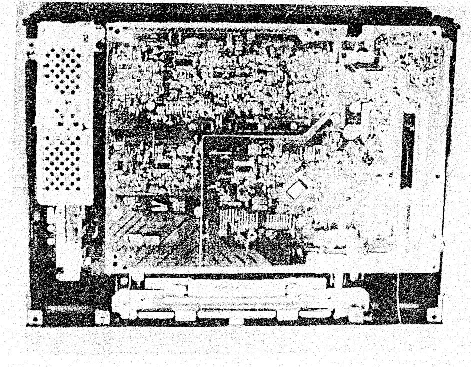


Fig 2-2.

2-2. REMOVAL OF BOTTOM PLATE

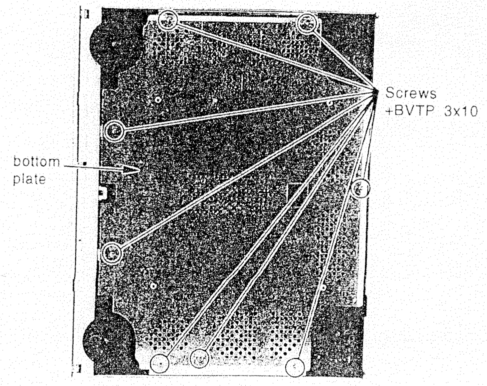

Screws
+BVTP 3x10
bottom
plate

Fig 2-3.

Then remove the bottom plate.

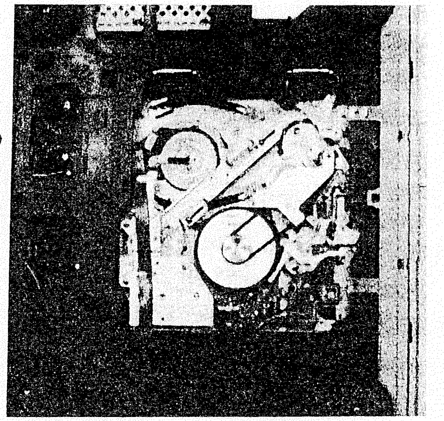


Fig 2-4.

2-3. REMOVAL OF FRONT CABINET

The remove the upper case, and screws (+BVTP 3x10), bottom plate and raise up the claws of front cabinet as shown by Fig 2-5, and remove front cabinet the arrow direction.

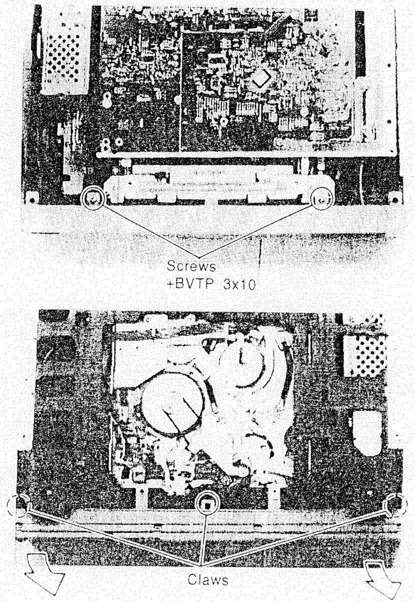
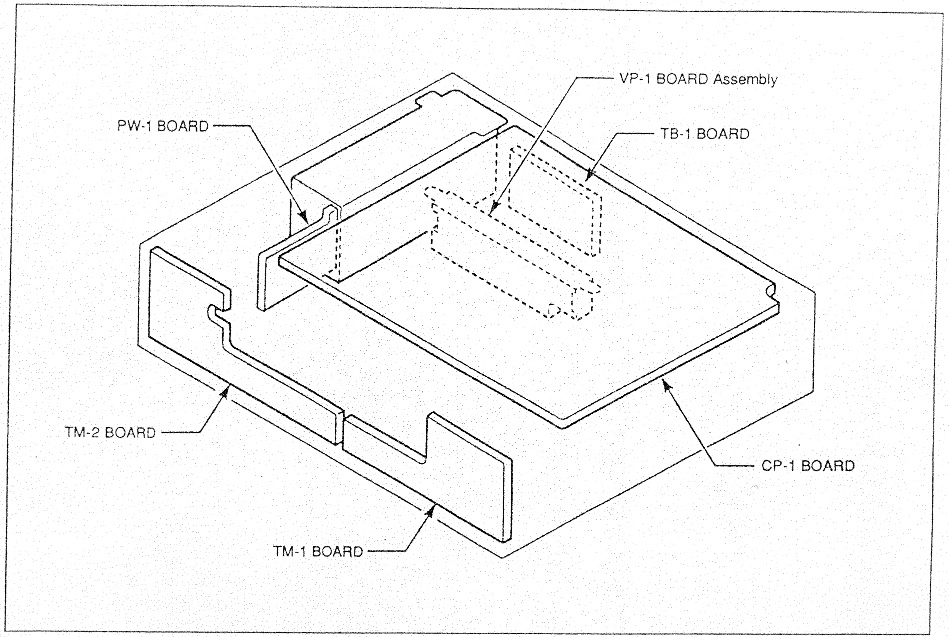

Screws
+BVTP 3x10
Claws

Fig 2-5.

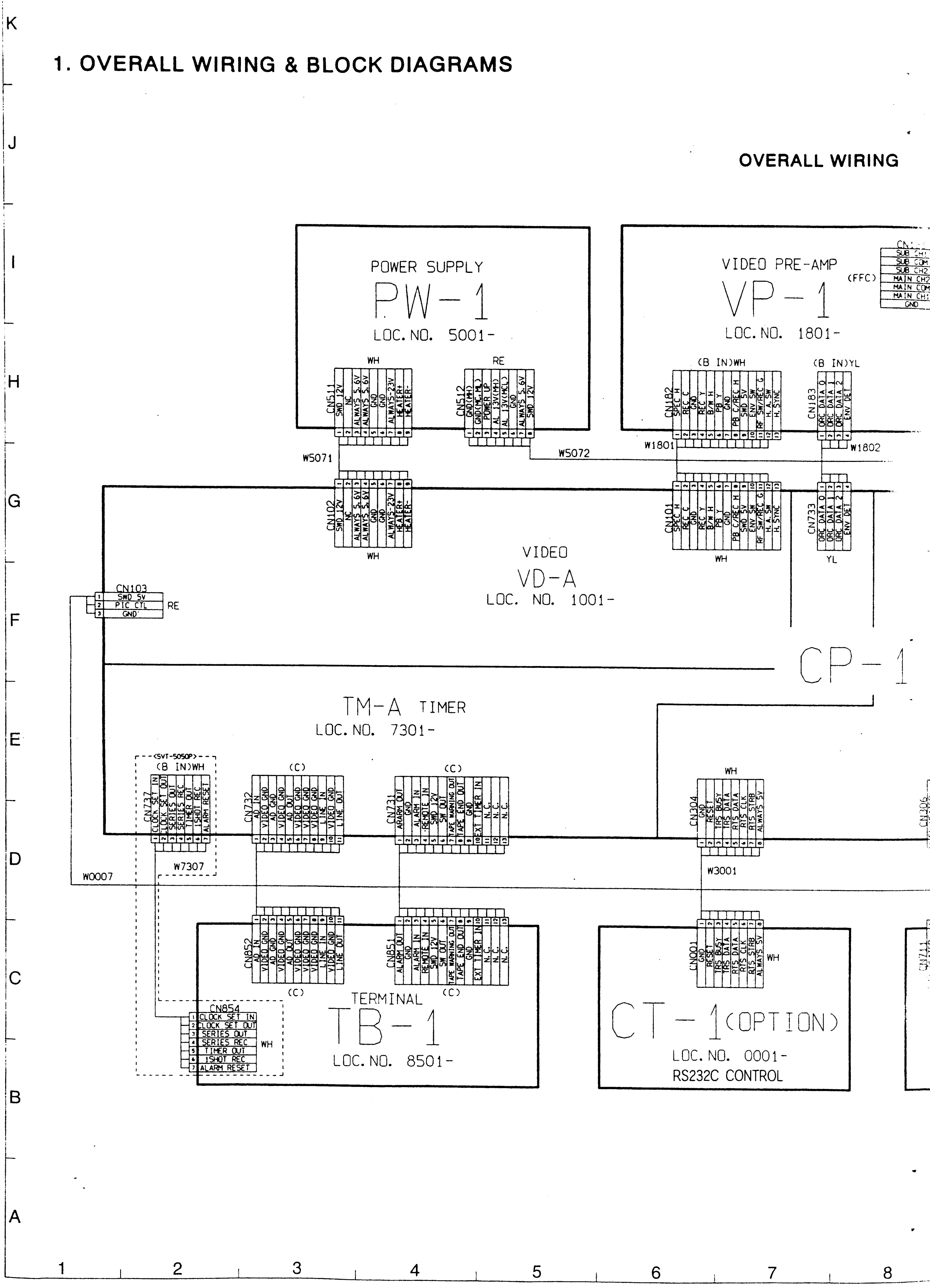
SECTION 3
DIAGRAM

3-1. CIRCUIT BOARDS LOCATION

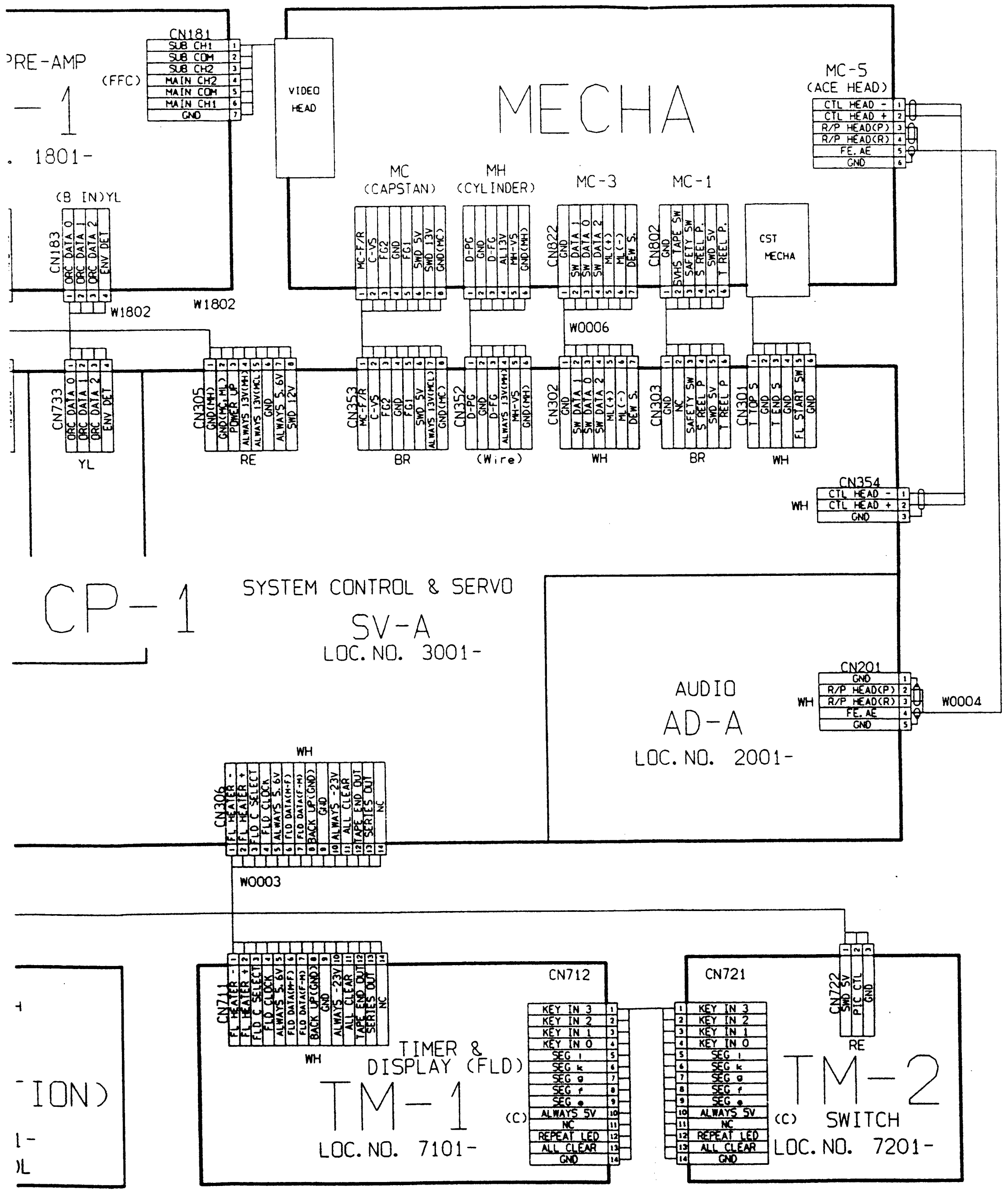

VP-1 BOARD Assembly
PW-1 BOARD
TB-1 BOARD
TM-2 BOARD
CP-1 BOARD
TM-1 BOARD

1. OVERALL WIRING & BLOCK DIAGRAMS

OVERALL WIRING

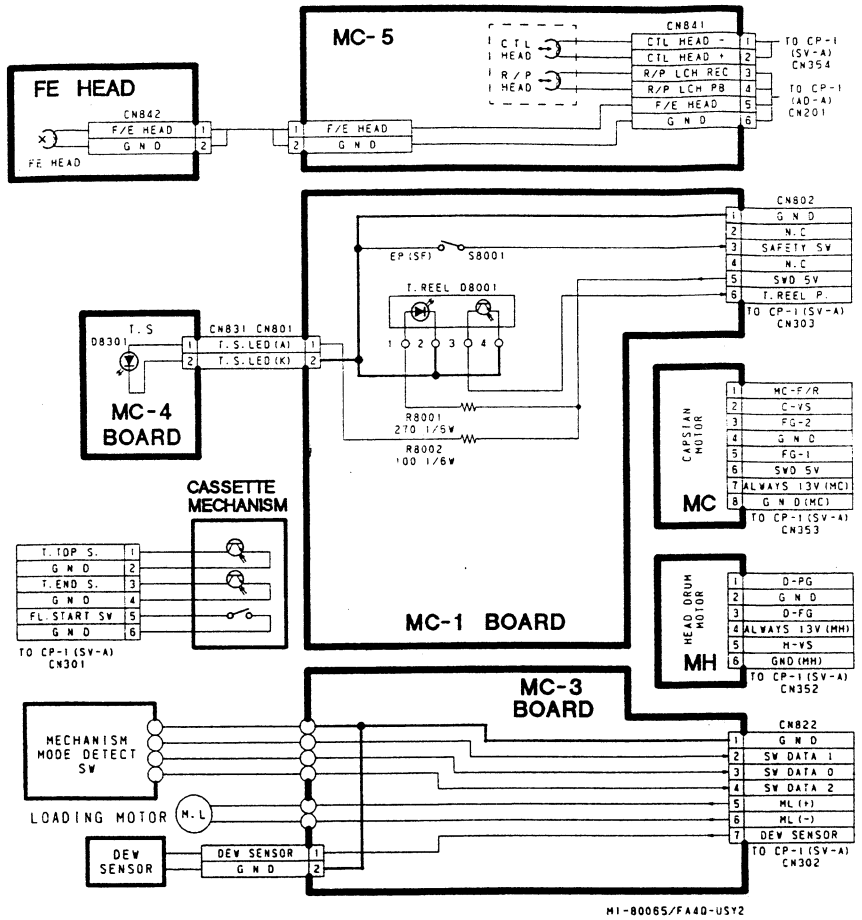

K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
POWER SUPPLY
PW-1
LOC. NO. 5001-
VIDEO PRE-AMP
VP-1
LOC. NO. 1801-
(FFC)
SUB CH1
SUB COM
SUB CH2
MAIN CH2
MAIN COM
MAIN CH1
GND
WH
RE
CN511
SWD 12V
NC
ALWAYS 5.6V
ALWAYS 5.6V
GND
GND
ALWAYS-23V
HEATER+
HEATER-
CN512
GND(MH)
GND(MC,ML)
POWER UP
AL 13V(MH)
AL 13V(MCL)
GND
ALWAYS 5.6V
SWD 12V
(B IN)WH
CN182
SPEC H
REC C
GND
REC Y
B/W H
PB Y
GND
PB C/REC H
SWD 5V
ENV SW
RF SW/REC G
H. A. SW
H. SYNC
(B IN)YL
CN183
ORC DATA 0
ORC DATA 1
ORC DATA 2
ENV DET
W5071
W5072
W1801
W1802
CN102
SWD 12V
NC
ALWAYS 5.6V
ALWAYS 5.6V
GND
GND
ALWAYS-23V
HEATER+
HEATER-
WH
CN101
SPEC H
REC C
GND
REC Y
B/W H
PB Y
GND
PB C/REC H
SWD 5V
ENV SW
RF SW/REC G
H. A. SW
H. SYNC
WH
CN733
ORC DATA 0
ORC DATA 1
ORC DATA 2
ENV DET
YL
VIDEO
VD-A
LOC. NO. 1001-
CN103
SWD 5V
PIC CTL
GND
RE
CP-1
TM-A TIMER
LOC. NO. 7301-
<SVT-5050P>
(B IN)WH
CN737
CLOCK SET IN
CLOCK SET OUT
SERIES OUT
SERIES REC
TIMER OUT
1SHOT REC
ALARM RESET
(C)
CN732
AD IN
VIDEO GND
AD GND
VIDEO GND
AD OUT
VIDEO GND
VIDEO GND
VIDEO GND
LINE IN
VIDEO GND
LINE OUT
(C)
CN731
ARARM OUT
GND
ALARM IN
REMOTE IN
SWD 12V
SW OUT
TAPE WARNING OUT
TAPE END OUT
GND
EXT TIMER IN
N.C.
N.C.
N.C.
WH
CN304
GND
RESET
TRS BUSY
TRS DATA
RTS DATA
RTS CLK
RTS STRB
ALWAYS 5V
CN306
W7307
W0007
W3001
CN852
AD IN
VIDEO GND
AD GND
VIDEO GND
AD OUT
VIDEO GND
VIDEO GND
VIDEO GND
LINE IN
VIDEO GND
LINE OUT
(C)
CN851
ALARM OUT
GND
ALARM IN
REMOTE IN
SWD 12V
SW OUT
TAPE WARNING OUT
TAPE END OUT
GND
EXT TIMER IN
N.C.
N.C.
N.C.
(C)
CN001
GND
RESET
TRS BUSY
TRS DATA
RTS DATA
RTS CLK
RTS STRB
ALWAYS 5V
WH
CN711
CN854
CLOCK SET IN
CLOCK SET OUT
SERIES OUT
SERIES REC
TIMER OUT
1SHOT REC
ALARM RESET
WH
TERMINAL
TB-1
LOC. NO. 8501-
CT-1(OPTION)
LOC. NO. 0001-
RS232C CONTROL

RALL WIRING



CN181
SUB CH1
SUB COM
SUB CH2
MAIN CH2
MAIN COM
MAIN CH1
GND
PRE-AMP
(FFC)
1801-
(B IN)YL
VIDEO HEAD
MECHA
MC-5
(ACE HEAD)
CTL HEAD -
CTL HEAD +
R/P HEAD(P)
R/P HEAD(R)
FE.AE
GND
MC
(CAPSTAN)
MH
(CYLINDER)
MC-3
MC-1
CST MECHA
CN183
CN822
CN802
W1802
W0006
CN733
CN305
CN353
CN352
CN302
CN303
CN301
YL
RE
BR
(Wire)
WH
BR
WH
CN354
CTL HEAD -
CTL HEAD +
GND
WH
CP-1
SYSTEM CONTROL & SERVO
SV-A
LOC.NO. 3001-
AUDIO
AD-A
LOC.NO. 2001-
CN201
GND
R/P HEAD(P)
R/P HEAD(R)
FE.AE
GND
WH
W0004
WH
CN306
W0003
CN711
WH
TIMER &
DISPLAY (FLD)
TM-1
LOC.NO. 7101-
(C)
CN712
KEY IN 3
KEY IN 2
KEY IN 1
KEY IN 0
SEG 1
SEG k
SEG g
SEG f
SEG e
ALWAYS 5V
NC
REPEAT LED
ALL CLEAR
GND
CN721
CN722
RE
TM-2
(C)
SWITCH
LOC.NO. 7201-
TION)

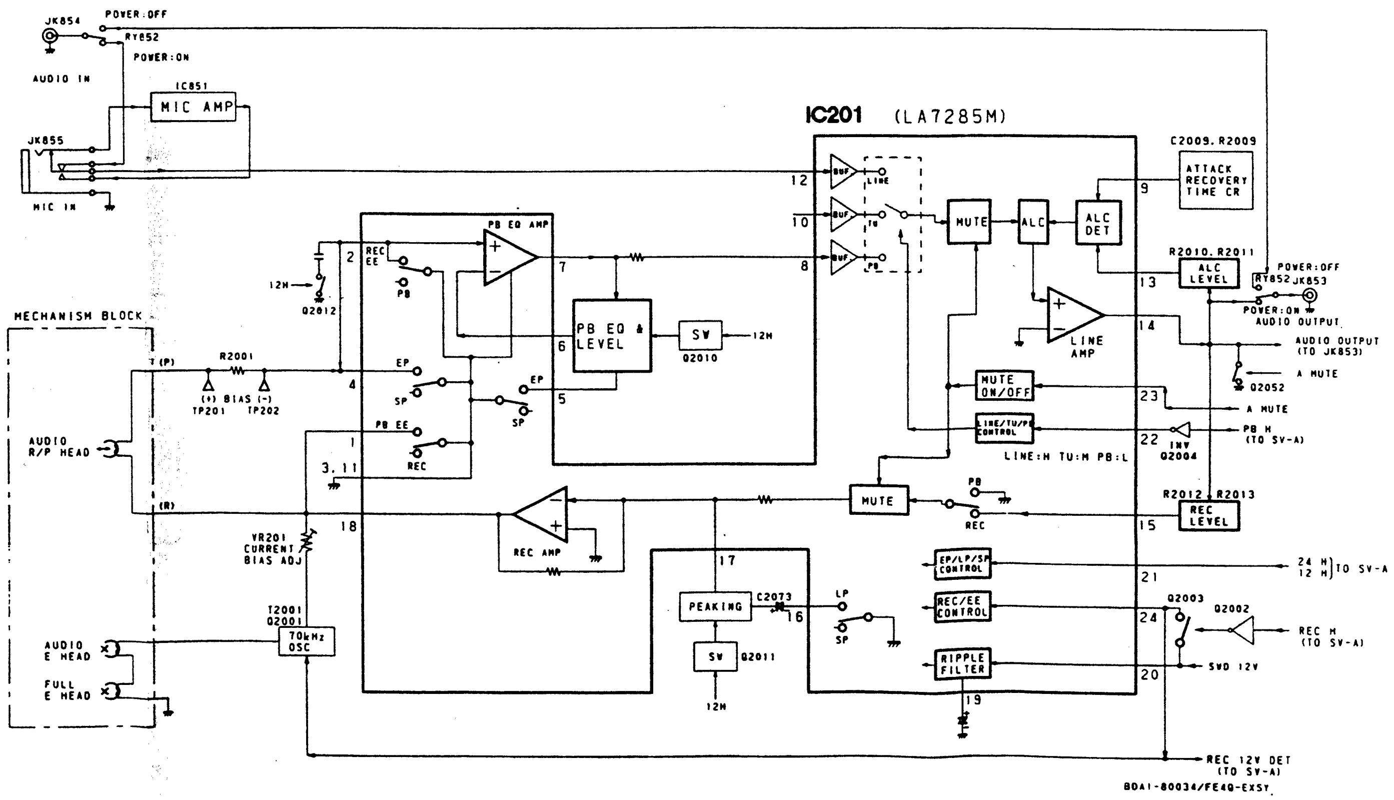
MECHANISM CONNECTION



FE HEAD
CN842
F/E HEAD
GND
FE HEAD
MC-5
CTL HEAD
R/P HEAD
CN841
CTL HEAD -
CTL HEAD +
R/P LCH REC
R/P LCH PB
F/E HEAD
GND
TO CP-1 (SV-A) CN354
TO CP-1 (AD-A) CN201
CN802
GND
N.C
SAFETY SV
N.C
SWD 5V
T.REEL P
TO CP-1 (SV-A) CN303
EP(SF)
S8001
T.REEL D8001
T.S
D8301
CN831 CN801
T.S.LED(A)
T.S.LED(K)
MC-4 BOARD
R8001 270 1/5W
R8002 100 1/6W
CASSETTE MECHANISM
T.TOP S.
GND
T.END S.
GND
FL.START SW
GND
TO CP-1 (SV-A) CN301
MC-1 BOARD
CAPSTAN MOTOR
MC
MC-F/R
C-VS
FG-2
GND
FG-1
SWD 5V
ALWAYS 13V (MC)
GND (MC)
TO CP-1 (SV-A) CN353
HEAD DRUM MOTOR
MH
D-PG
GND
D-FG
ALWAYS 13V (MH)
M-VS
GND (MH)
TO CP-1 (SV-A) CN352
MC-3 BOARD
MECHANISM MODE DETECT SW
LOADING MOTOR
M-L
CN822
GND
SW DATA 1
SW DATA 0
SW DATA 2
ML(+)
ML(-)
DEW SENSOR
TO CP-1 (SV-A) CN302
DEW SENSOR
DEW SENSOR
GND

MI-80065/FA40-USY2

AUDIO CIRCUIT

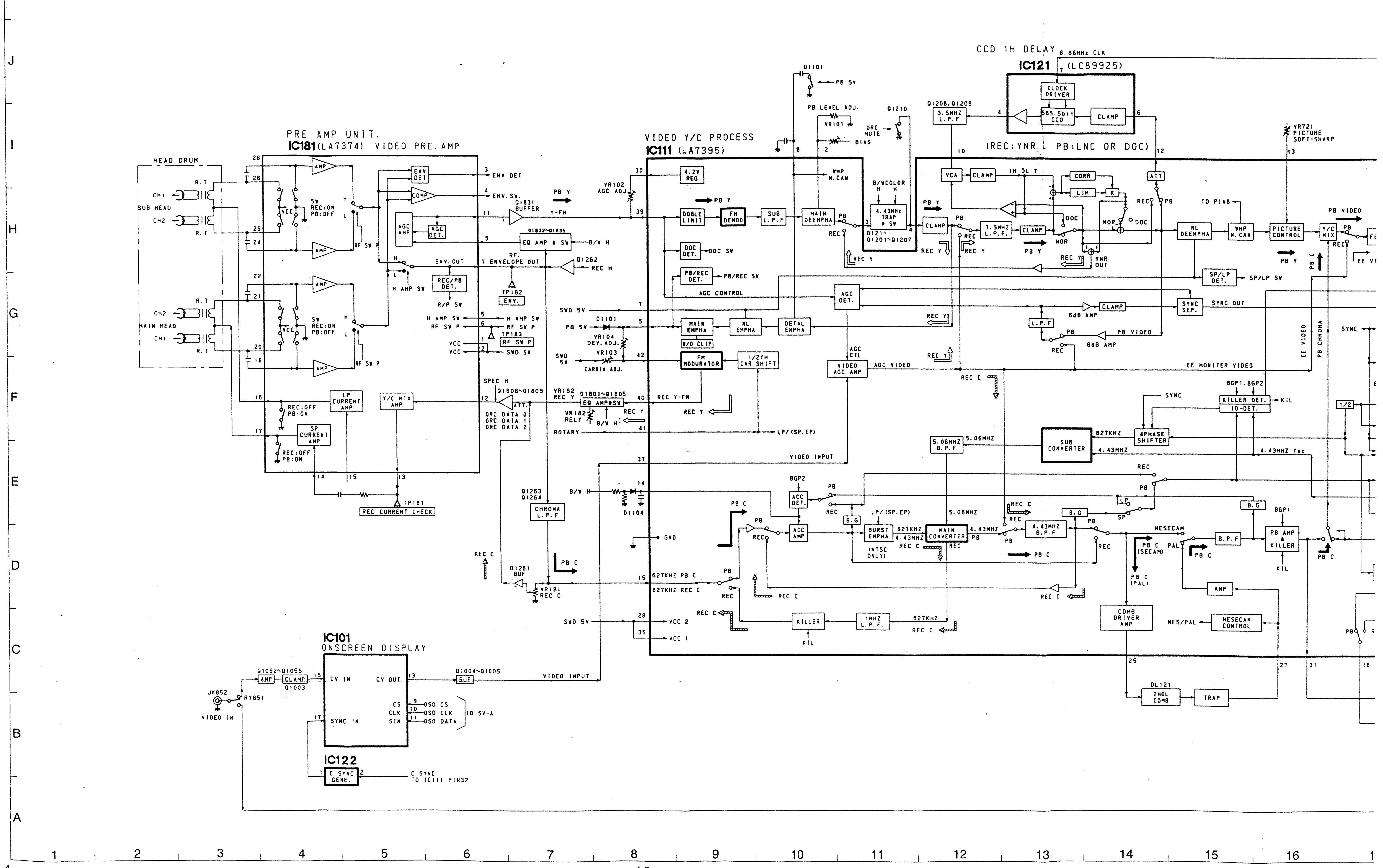


JK854
POWER:OFF
RY852
POWER:ON
AUDIO IN
IC851
MIC AMP
JK855
MIC IN
IC201 (LA7285M)
BUF
LINE
TU
PB
MUTE
ALC
ALC DET
ATTACK RECOVERY TIME CR
C2009, R2009
R2010, R2011
ALC LEVEL
POWER:OFF
RY852 JK853
POWER:ON
AUDIO OUTPUT
AUDIO OUTPUT (TO JK853)
A MUTE
Q2052
LINE AMP
MUTE ON/OFF
LINE/TU/PB CONTROL
LINE:H TU:M PB:L
PB H (TO SV-A)
INV Q2004
R2012, R2013
REC LEVEL
PB EQ AMP
REC
EE
PB
12M
Q2012
PB EQ & LEVEL
SW
Q2010
12M
MECHANISM BLOCK
T(P)
R2001
(+) BIAS (-)
TP201 TP202
EP
SP
EP
SP
PB EE
SP
REC
3.11
AUDIO R/P HEAD
(R)
VR201 CURRENT BIAS ADJ
REC AMP
MUTE
PB
REC
PEAKING
C2073
LP
SP
SW
Q2011
12M
EP/LP/SP CONTROL
REC/EE CONTROL
RIPPLE FILTER
24 H / 12 H (TO SV-A)
Q2003
Q2002
REC H (TO SV-A)
SWD 12V
T2001
Q2001
70kHz OSC
AUDIO E HEAD
FULL E HEAD
REC 12V DET (TO SV-A)
1
2
3
4
5
6
7
8
9
10
12
13
14
15
16
17
18
19
20
21
22
23
24

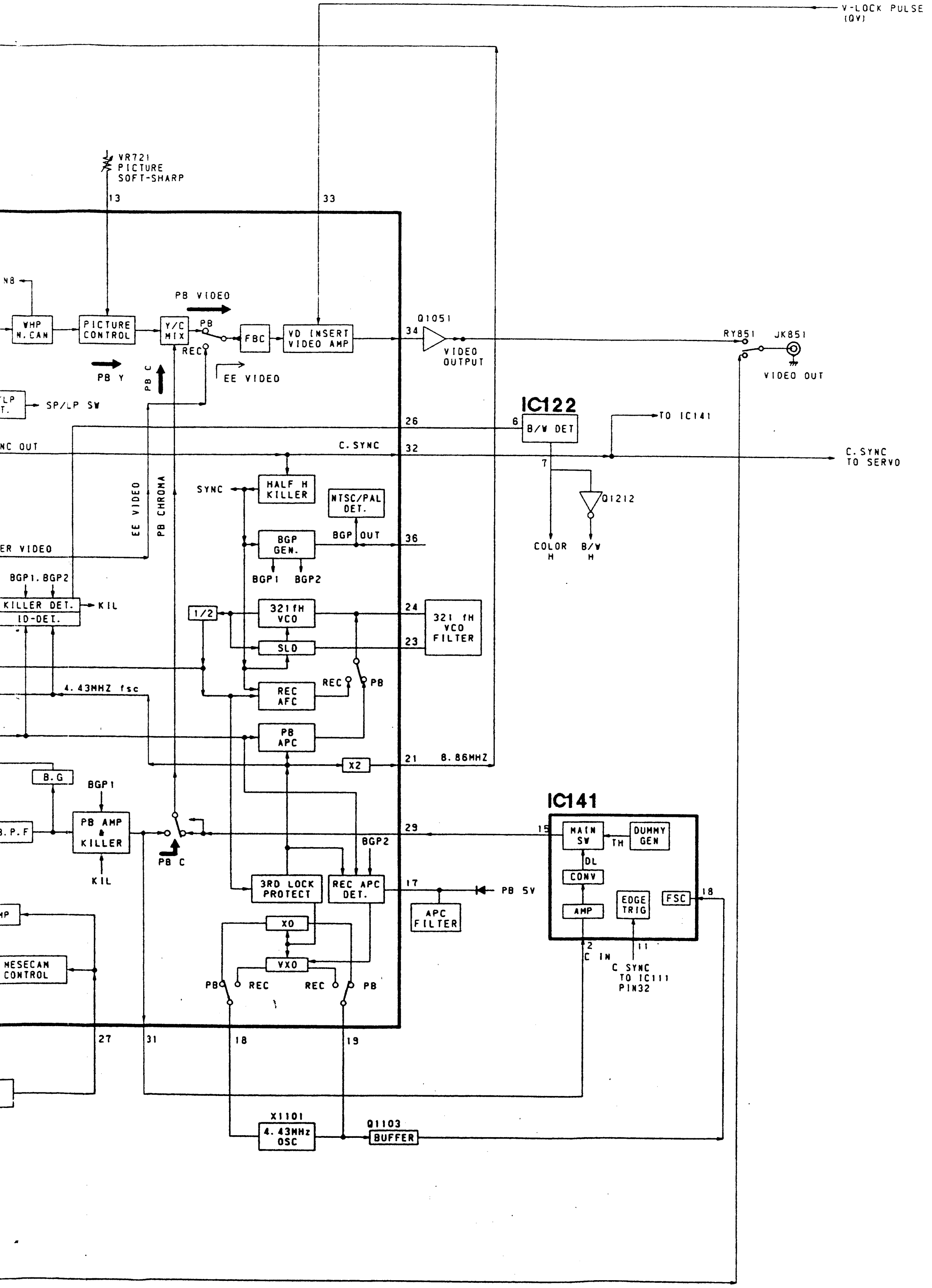
8DA1-80034/FE40-EXSY

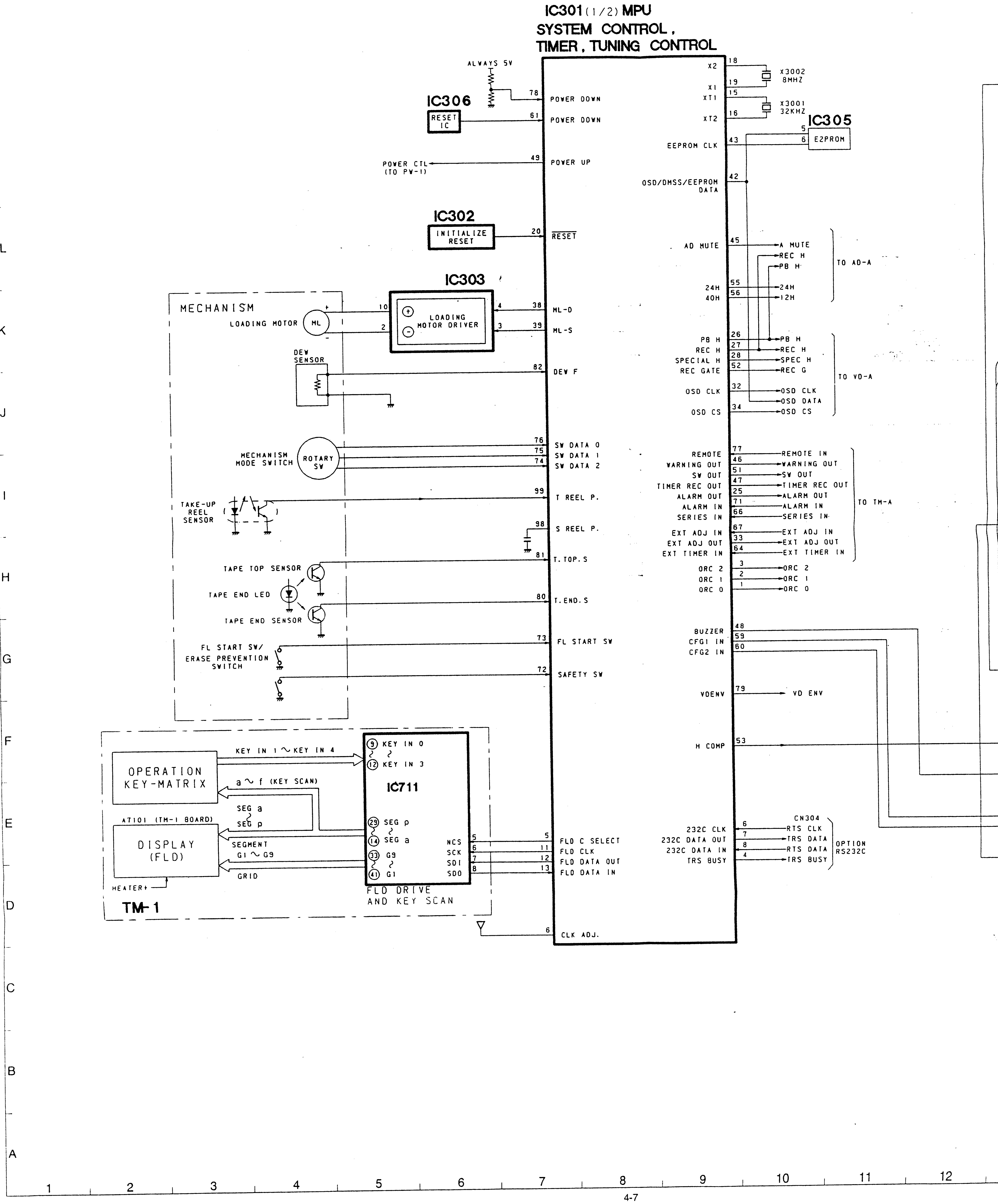
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

VIDEO CIRCUIT

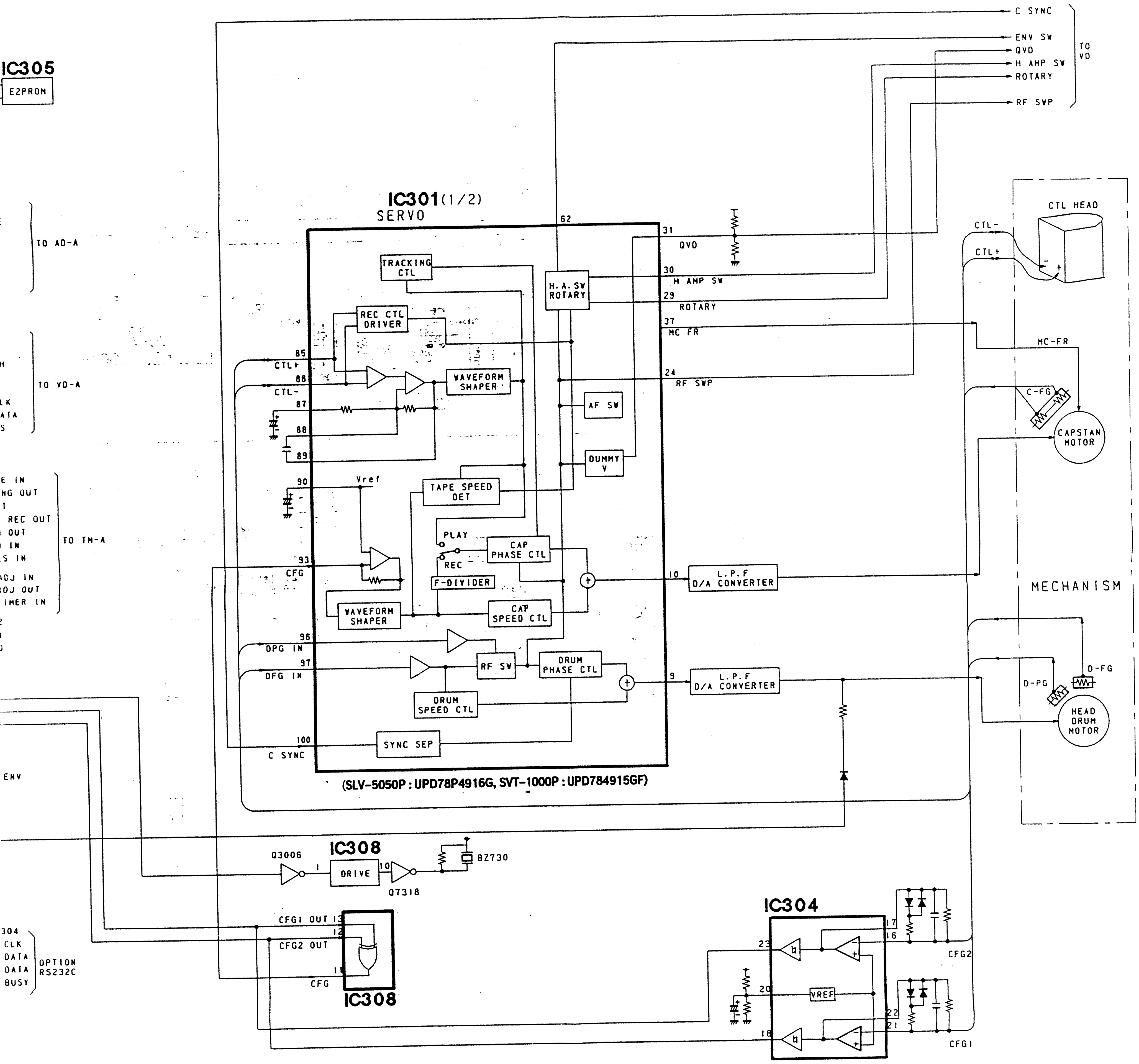


K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
HEAD DRUM
CH1
SUB HEAD
CH2
R.T
MAIN HEAD
PRE AMP UNIT.
IC181 (LA7374) VIDEO PRE.AMP
AMP
SW
REC:ON
PB:OFF
VCC
RF SW P
ENV DET
COMP
AGC AMP
AGC DET.
ENV DET
ENV.SW.
Q1831 BUFFER
Y-FM
PB Y
Q1832~Q1835
EQ AMP & SW
B/W H
ENV.OUT
RF.
7 ENVELOPE OUT
Q1262
REC H
H AMP SW
REC/PB DET.
R/P SW
TP182
ENV.
H AMP SW
RF SW P
TP183
RF SW P
VCC
SWD 5V
LP CURRENT AMP
Y/C MIX AMP
SP CURRENT AMP
REC:OFF
PB:ON
SPEC H
Q1806~Q1809
ATT.
ORC DATA 0
ORC DATA 1
ORC DATA 2
TP181
REC CURRENT CHECK
VIDEO Y/C PROCESS
IC111 (LA7395)
VR102
AGC ADJ
4.2V REG
DOBLE LIMIT
FM DEMOD
SUB L.P.F
MAIN DEEMPHA
DOC DET.
DOC SW
PB/REC DET.
PB/REC SW
AGC CONTROL
SWD 5V
D1101
PB 5V
VR104
DEV.ADJ.
VR103
CARRIA ADJ.
MAIN EMPHA
W/D CLIP
NL EMPHA
DETAL EMPHA
FM MODURATOR
1/2fH CAR.SHIFT
VR182
REC Y
Q1801~Q1805
EQ AMP&SW
VR182
RELY
REC Y-FM
ROTARY
LP/(SP.EP)
VIDEO INPUT
B/W H
D1104
GND
Q1263
Q1264
CHROMA L.P.F
PB C
REC C
Q1261 BUF
VR181 REC C
627KHZ PB C
627KHZ REC C
VCC 2
VCC 1
Q1101
PB 5V
PB LEVEL ADJ.
VR101
Q1210
ORC MUTE
BIAS
WHP N.CAN
B/W COLOR
4.43MHz TRAP & SW
Q1211
Q1201~Q1207
CCD 1H DELAY
8.86MHz CLK
IC121 (LC89925)
CLOCK DRIVER
585.5bit CCD
CLAMP
Q1208, Q1209
3.5MHZ L.P.F
(REC:YNR , PB:LNC OR DOC)
VCA
1H DL Y
CORR
LIM
K
ATT
DOC
NOR
YNR OUT
3.5MHZ L.P.F.
VR721
PICTURE SOFT-SHARP
TO PIN8
NL DEEMPHA
WHP N.CAN
PICTURE CONTROL
Y/C MIX
PB VIDEO
SP/LP DET.
SP/LP SW
AGC DET.
AGC CTL
VIDEO AGC AMP
AGC VIDEO
L.P.F
6dB AMP
SYNC SEP.
SYNC OUT
EE MONITER VIDEO
EE VIDEO
PB CHROMA
SYNC
BGP1, BGP2
KILLER DET.
ID-DET.
KIL
1/2
5.06MHZ B.P.F
5.06MHZ
SUB CONVERTER
627KHZ
4.43MHZ
4PHASE SHIFTER
4.43MHZ fsc
BGP2
ACC DET.
ACC AMP
B.G
LP/(SP.EP)
BURST EMPHA
(NTSC ONLY)
MAIN CONVERTER
4.43MHZ B.P.F
LP
SP
MESECAM
PAL
PB C (SECAM)
PB C (PAL)
B.P.F
BGP1
PB AMP & KILLER
KILLER
1MHZ L.P.F.
627KHZ
COMB DRIVER AMP
AMP
MES/PAL
MESECAM CONTROL
DL121
2HDL COMB
TRAP
IC101
ONSCREEN DISPLAY
CV IN
CV OUT
SYNC IN
CS
CLK
SIN
OSD CS
OSD CLK
OSD DATA
TO SV-A
Q1052~Q1055
AMP
CLAMP
Q1003
Q1004~Q1005
BUF
JK852
RY851
VIDEO IN
IC122
C SYNC GENE.
C SYNC
TO IC111 PIN32


V-LOCK PULSE
(QV)
VR721
PICTURE
SOFT-SHARP
13
33
N8
VHP
N.CAN
PICTURE
CONTROL
Y/C
MIX
PB VIDEO
PB
REC
FBC
VD INSERT
VIDEO AMP
34
Q1051
VIDEO
OUTPUT
RY851
JK851
VIDEO OUT
PB Y
PB C
EE VIDEO
SP/LP SW
IC122
26
6
B/W DET
TO IC141
NC OUT
C.SYNC
32
C.SYNC
TO SERVO
7
Q1212
COLOR
H
B/W
H
EE VIDEO
PB CHROMA
SYNC
HALF H
KILLER
NTSC/PAL
DET.
BGP
GEN.
BGP OUT
36
BGP1
BGP2
ER VIDEO
BGP1.BGP2
KILLER DET.
ID-DET.
KIL
1/2
321fH
VCO
24
321 fH
VCO
FILTER
SLD
23
4.43MHZ fsc
REC
PB
REC
AFC
PB
APC
X2
21
8.86MHZ
B.G
BGP1
IC141
B.P.F
PB AMP
&
KILLER
KIL
PB C
29
BGP2
15
MAIN
SW
TH
DUMMY
GEN
DL
CONV
AMP
EDGE
TRIG
FSC
18
3RD LOCK
PROTECT
REC APC
DET.
17
PB 5V
APC
FILTER
XO
VXO
PB
REC
REC
PB
2
C IN
11
C SYNC
TO IC111
PIN32
HESECAM
CONTROL
27
31
18
19
X1101
4.43MHz
OSC
Q1103
BUFFER

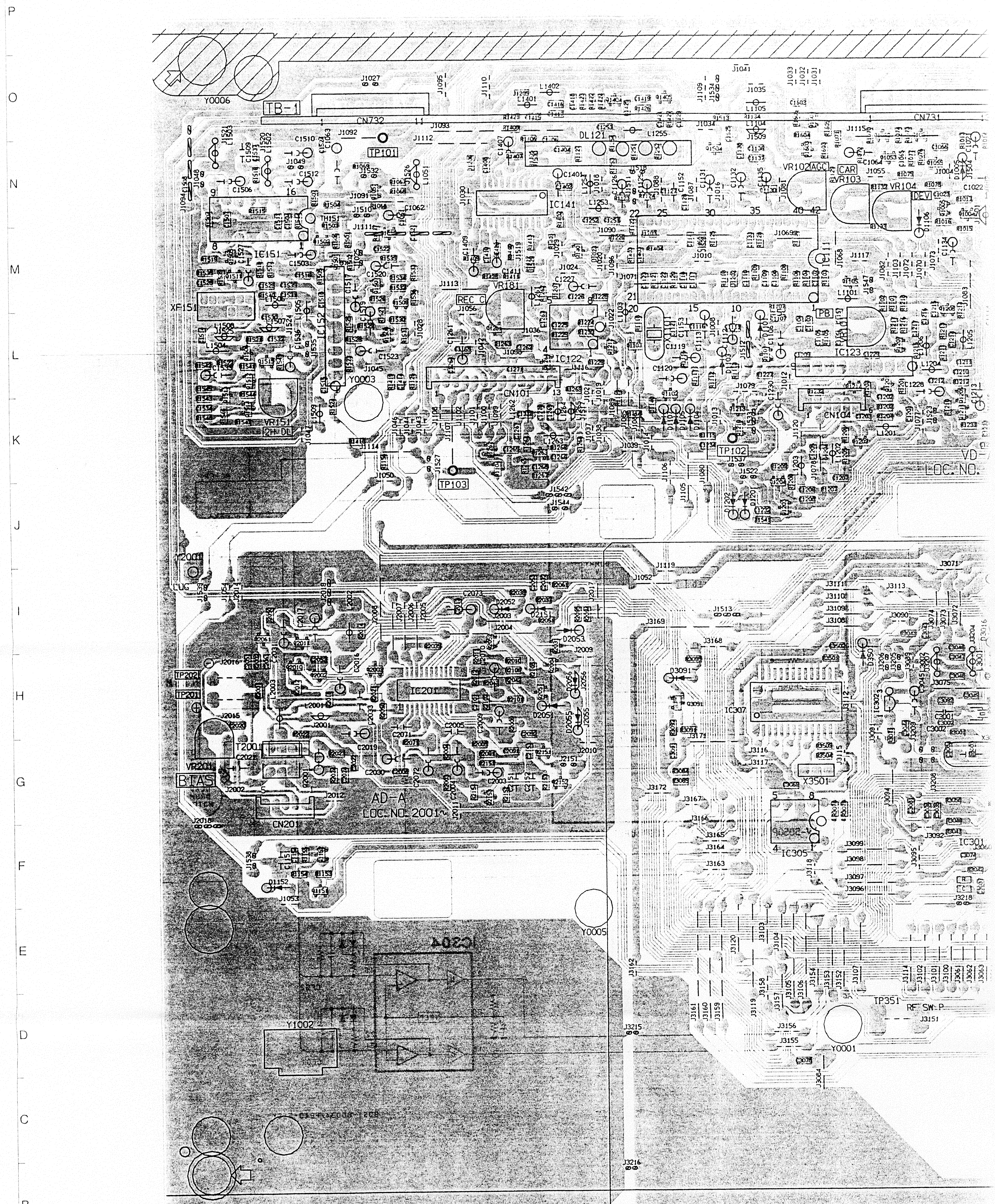

IC301 (1/2) MPU
SYSTEM CONTROL,
TIMER, TUNING CONTROL
ALWAYS 5V
78 POWER DOWN
IC306
RESET IC
61 POWER DOWN
POWER CTL (TO PW-1)
49 POWER UP
IC302
INITIALIZE RESET
20 RESET
IC303
LOADING MOTOR DRIVER
MECHANISM
LOADING MOTOR
ML
10
2
4
3
38 ML-O
39 ML-S
DEW SENSOR
82 DEW F
MECHANISM MODE SWITCH
ROTARY SW
76 SW DATA 0
75 SW DATA 1
74 SW DATA 2
TAKE-UP REEL SENSOR
99 T REEL P.
98 S REEL P.
TAPE TOP SENSOR
81 T. TOP. S
TAPE END LED
TAPE END SENSOR
80 T. END. S
FL START SW/ ERASE PREVENTION SWITCH
73 FL START SW
72 SAFETY SW
OPERATION KEY-MATRIX
KEY IN 1 ~ KEY IN 4
a ~ f (KEY SCAN)
SEG a ~ SEG p
A7101 (TM-1 BOARD)
DISPLAY (FLD)
SEGMENT G1 ~ G9
GRID
HEATER+
TM-1
IC711
⑨ KEY IN 0
⑫ KEY IN 3
㉙ SEG p
⑭ SEG a
㉝ G9
㊶ G1
NCS 5
SCK 6
SDI 7
SDO 8
FLD DRIVE AND KEY SCAN
5 FLD C SELECT
11 FLD CLK
12 FLD DATA OUT
13 FLD DATA IN
6 CLK ADJ.
X2 18
X1 19
XT1 15
XT2 16
X3002 8MHZ
X3001 32KHZ
IC305
E2PROM
5
6
EEPROM CLK 43
OSD/DMSS/EEPROM DATA 42
AD MUTE 45
A MUTE
REC H
PB H
24H 55
40H 56
24H
12H
TO AD-A
PB H 26
REC H 27
SPECIAL H 28
REC GATE 52
OSD CLK 32
OSD CS 34
PB H
REC H
SPEC H
REC G
OSD CLK
OSD DATA
OSD CS
TO VD-A
REMOTE 77
WARNING OUT 46
SW OUT 51
TIMER REC OUT 47
ALARM OUT 25
ALARM IN 71
SERIES IN 66
EXT ADJ IN 67
EXT ADJ OUT 33
EXT TIMER IN 64
REMOTE IN
WARNING OUT
SW OUT
TIMER REC OUT
ALARM OUT
ALARM IN
SERIES IN
EXT ADJ IN
EXT ADJ OUT
EXT TIMER IN
TO TM-A
ORC 2 3
ORC 1 2
ORC 0 1
ORC 2
ORC 1
ORC 0
BUZZER 48
CFG1 IN 59
CFG2 IN 60
VDENV 79
VD ENV
H COMP 53
232C CLK 6
232C DATA OUT 7
232C DATA IN 8
TRS BUSY 4
CN304
RTS CLK
TRS DATA
RTS DATA
TRS BUSY
OPTION RS232C
L
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12

ONTROL & SERVO CIRCUIT

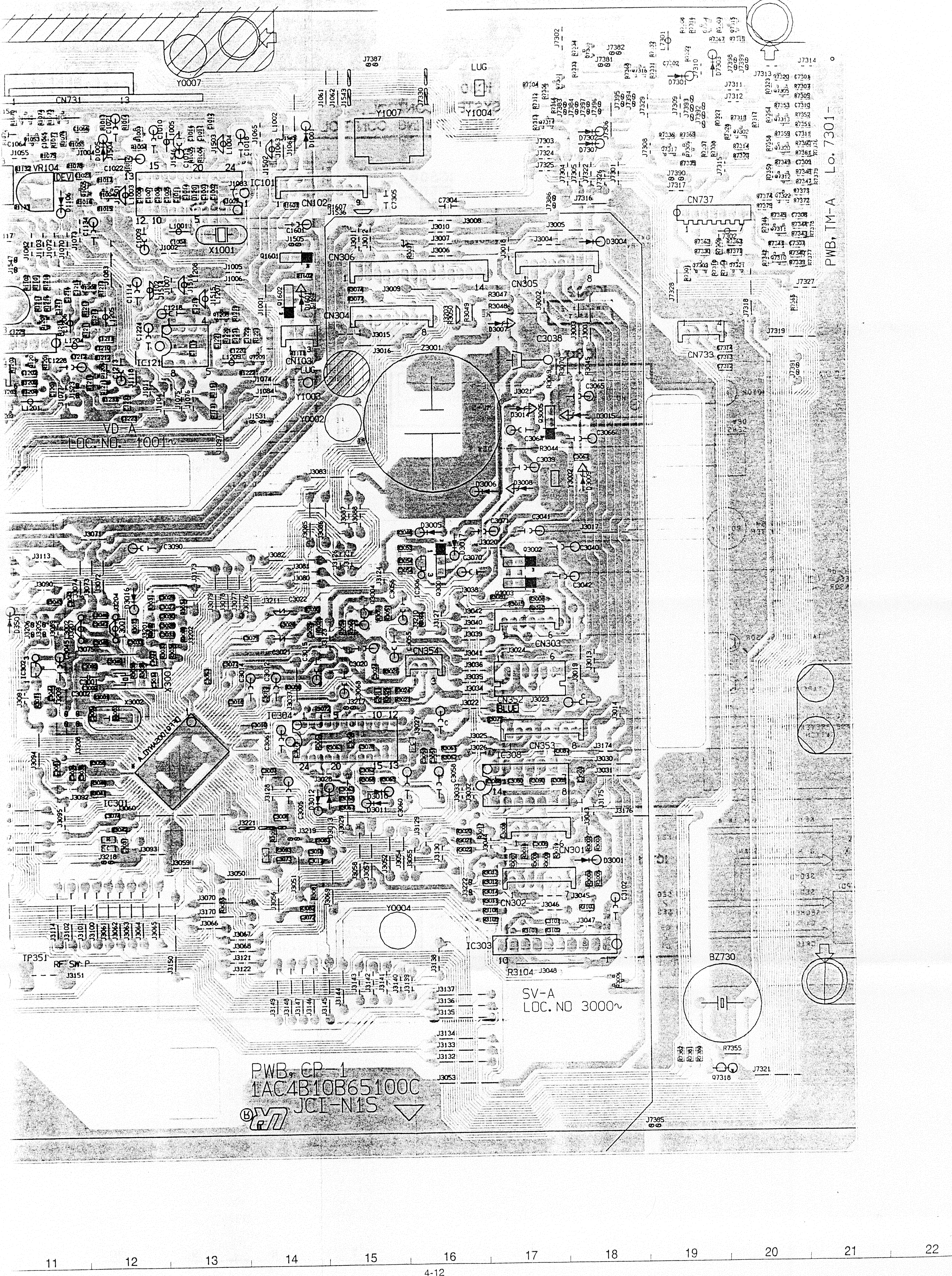


IC305
E2PROM
TO AD-A
TO VD-A
TO TM-A
IC301(1/2)
SERVO
TRACKING CTL
REC CTL DRIVER
WAVEFORM SHAPER
H.A.SW ROTARY
AF SW
DUMMY V
TAPE SPEED DET
PLAY
REC
CAP PHASE CTL
F-DIVIDER
CAP SPEED CTL
RF SW
DRUM PHASE CTL
DRUM SPEED CTL
SYNC SEP
Vref
CTL+
CTL-
CFG
DPG IN
DFG IN
C SYNC
QVD
H AMP SW
ROTARY
MC FR
RF SWP
L.P.F D/A CONVERTER
(SLV-5050P : UPD78P4916G, SVT-1000P : UPD784915GF)
C SYNC
ENV SW
QVD
H AMP SW
ROTARY
RF SWP
TO VD
CTL HEAD
MC-FR
C-FG
CAPSTAN MOTOR
MECHANISM
D-FG
D-PG
HEAD DRUM MOTOR
ENV
Q3006
IC308
DRIVE
Q7318
BZ730
CFG1 OUT
CFG2 OUT
CFG
IC308
OPTION RS232C
CLK
DATA
DATA
BUSY
IC304
VREF
CFG2
CFG1

8DS1-80034/FE4Q-EXSY

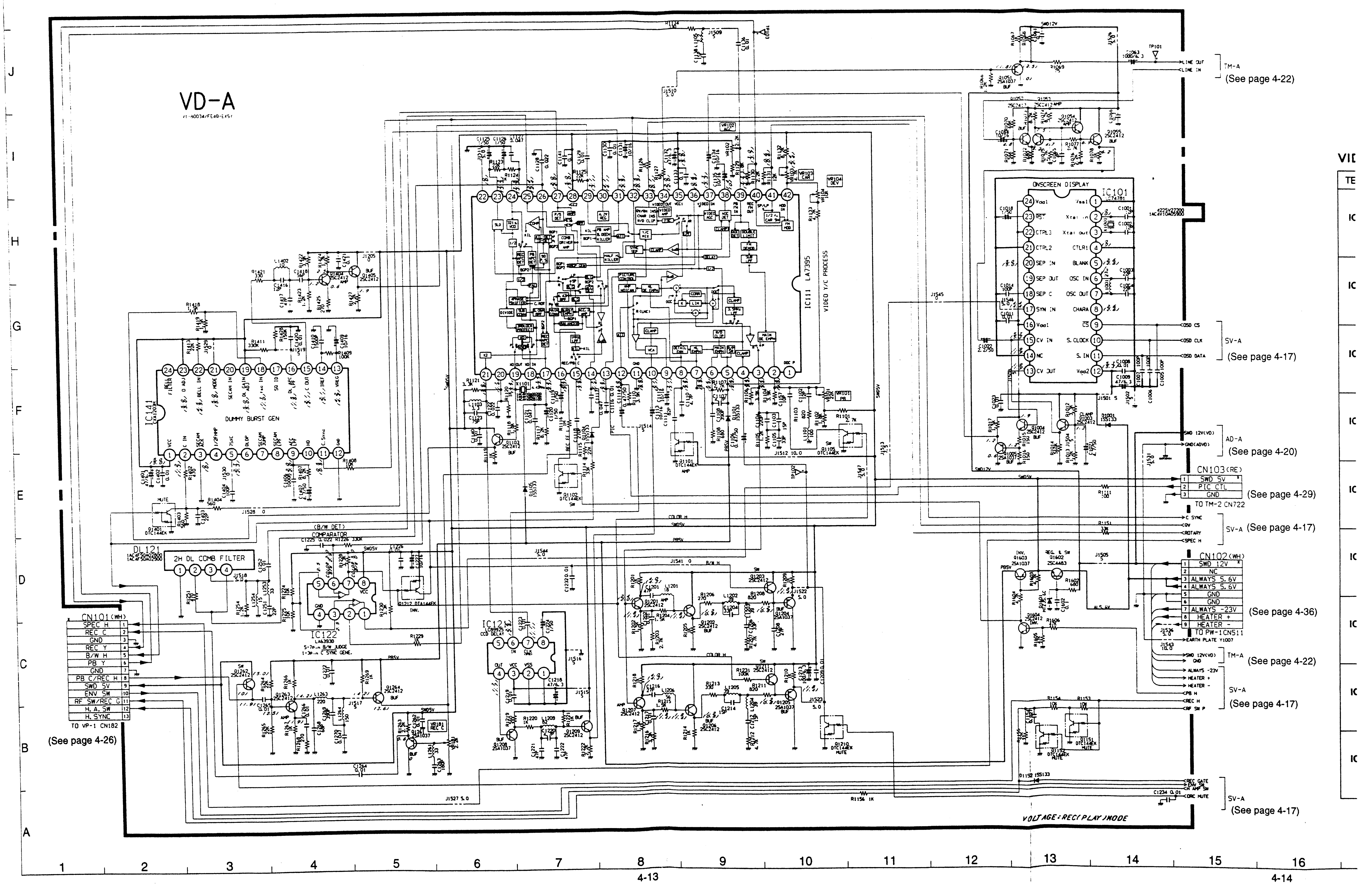

P
O
N
M
L
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
TB-1
CN732
CN731
Y0006
TP101
TP102
TP103
IC151
IC152
IC141
IC122
IC123
IC201
IC307
IC305
IC301
IC304
DL121
XF151
VR151
2H DL
VR181
REC C
VR102
AGC
VR103
CAR
VR104
DEV
VR161
PB
CN101
CN104
Y0003
VD
LOC. NO.
Y2001
LUG
TP202
TP201
VR201
BIAS
T2001
CN201
AD-A
LOC. NO. 2001~
X3501
Y0005
Y1002
TP351
RF SW P
Y0001

P.W.B.



CN731
Y0007
Y1007
Y1004
LUG
VR104
DEV
IC101
CN102
X1001
IC121
CN306
CN305
CN304
CN103
Y1003
Y0002
Z3001
VD-A
LOC.NO. 1001~
CN737
CN733
PWB, TM-A Lo. 7301-
IC396
CN354
CN303
CN352
BLUE
CN353
IC304
IC308
X300
X3002
IC301
CN301
CN302
IC303
Y0004
TP351
RF SW P
BZ730
SV-A
LOC.NO 3000~
PWB, CP-1
1AC4B10B65100C
JCI-N1S
11
12
13
14
15
16
17
18
19
20
21
22

CP-1 (VD-A) BOARD VIDEO



VD-A
K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
IC111 LA7395 VIDEO Y/C PROCESS
IC101 ONSCREEN DISPLAY
IC141 DUMMY BURST GEN
DL121 2H DL COMB FILTER
IC122 LA6393D 5-7pin B/W JUDGE 1-3pin C SYNC GENE.
IC121 CCD DELAY
(B/W DET) COMPARATOR
CN101(WH)
SPEC H
REC C
GND
REC Y
B/W H
PB Y
GND
PB C/REC H
SWD 5V
ENV SW
RF SW/REC G
H. A. SW
H. SYNC
TO VP-1 CN182
(See page 4-26)
LINE OUT
LINE IN
TM-A
(See page 4-22)
OSD CS
OSD CLK
OSD DATA
SV-A
(See page 4-17)
SWD 12V(VD)
GND(ADVD)
AD-A
(See page 4-20)
CN103(RE)
SWD 5V
PIC CTL
GND
(See page 4-29)
TO TM-2 CN722
C SYNC
CV
ROTARY
SPEC H
SV-A (See page 4-17)
CN102(WH)
SWD 12V
NC
ALWAYS 5.6V
ALWAYS 5.6V
GND
GND
ALWAYS -23V
HEATER +
HEATER -
(See page 4-36)
TO PW-1CN511
EARTH PLATE Y1007
SWD 12V(VD)
GND
ALWAYS -23V
HEATER +
HEATER -
TM-A
(See page 4-22)
PB H
REC H
RF SW P
SV-A
(See page 4-17)
REC GATE
ENV SW
CH AMP SW
CRC MUTE
SV-A
(See page 4-17)
VOLTAGE: REC(PLAY)MODE

:ge 4-22)

:ge 4-17)

:ge 4-20)

:e page 4-29)

:e page 4-17)

:e page 4-36)

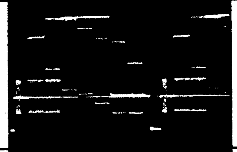
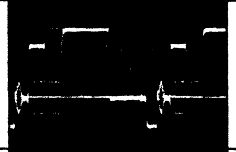
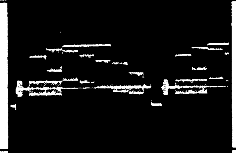
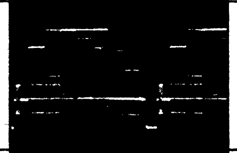
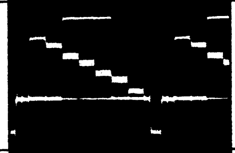
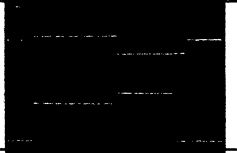
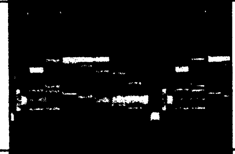
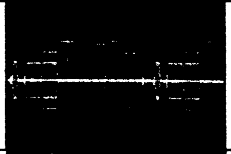
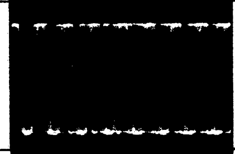
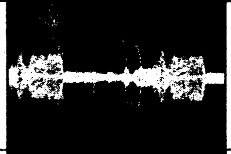
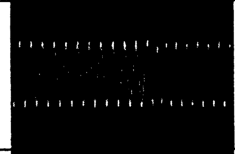
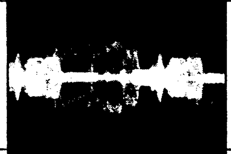
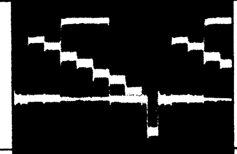
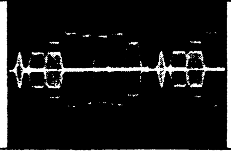
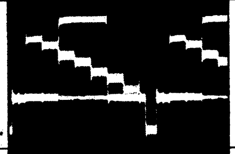
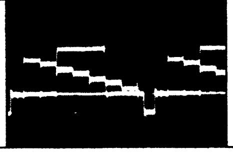
:e page 4-22)

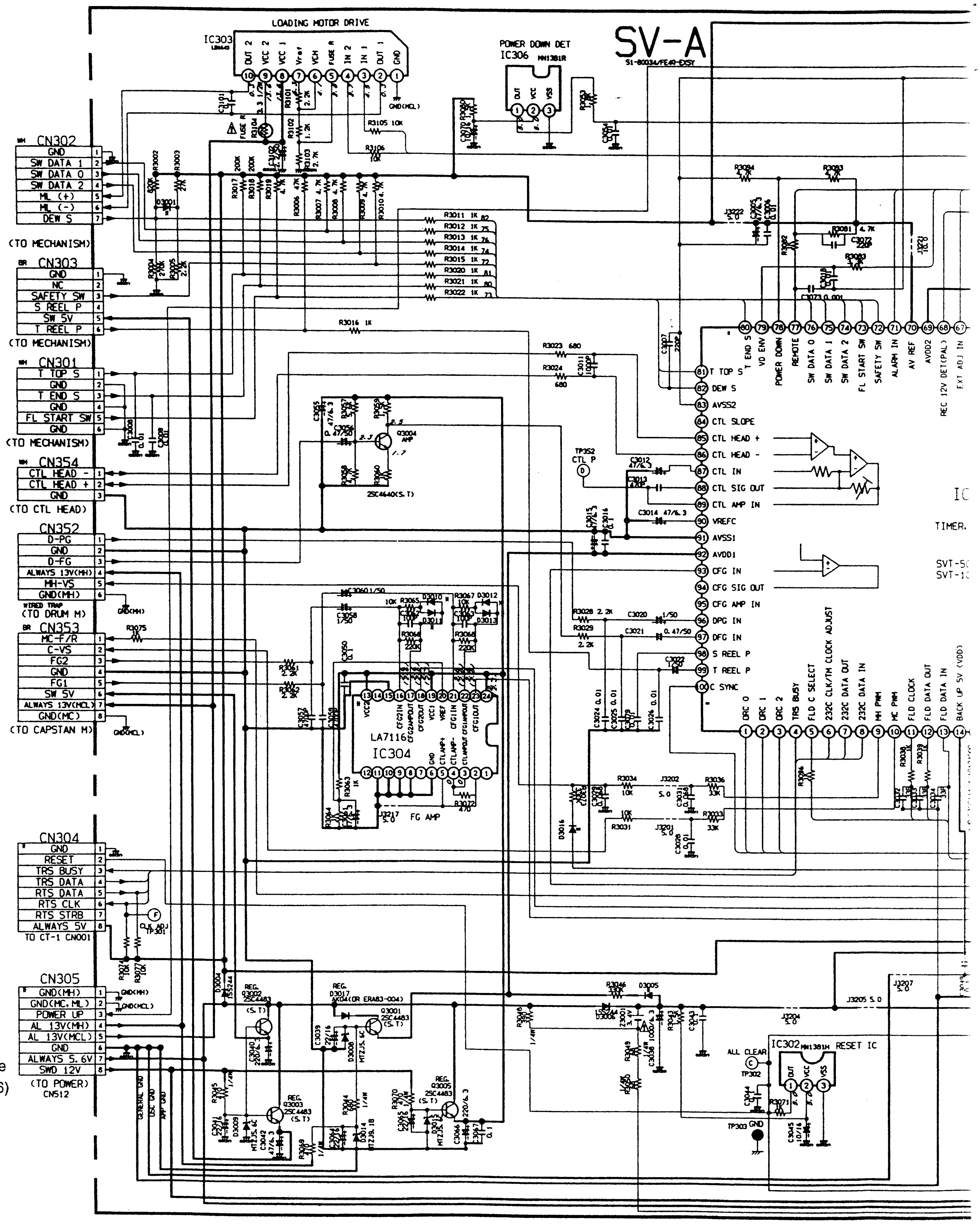
:ge 4-17)

:ge 4-17)

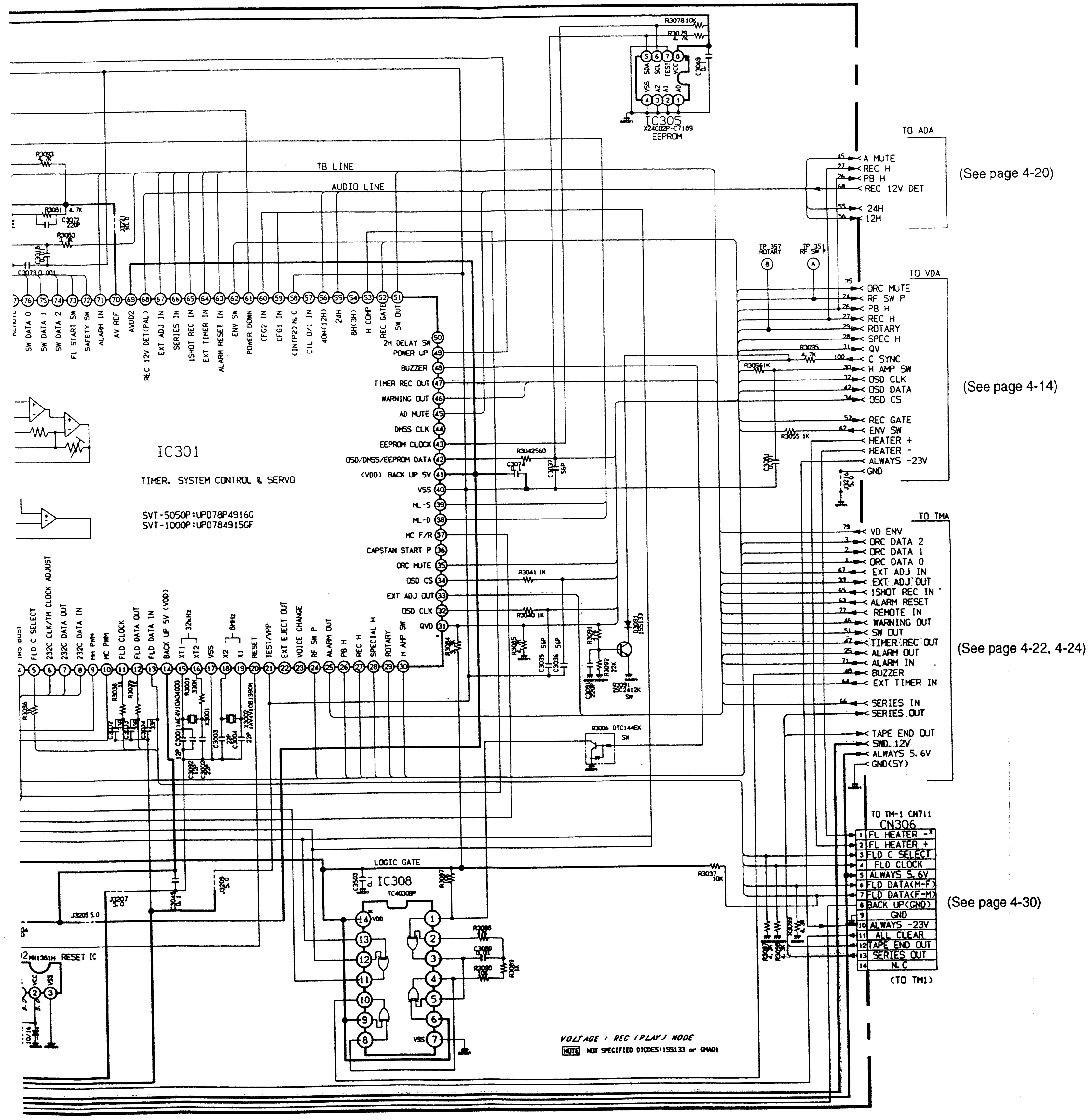
VIDEO CIRCUIT WAVEFORMS

WF-V-EA

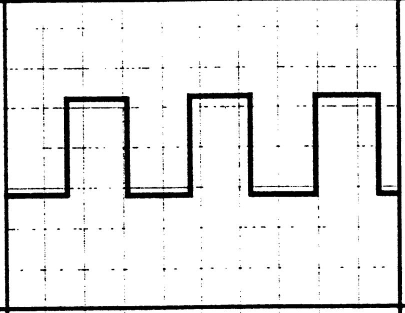
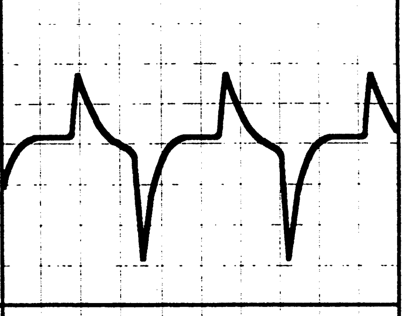
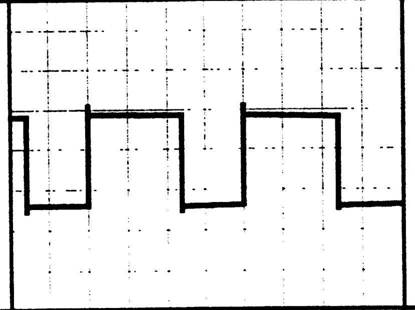
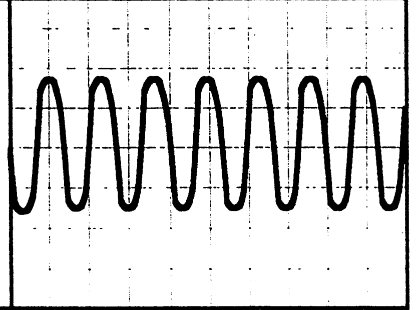
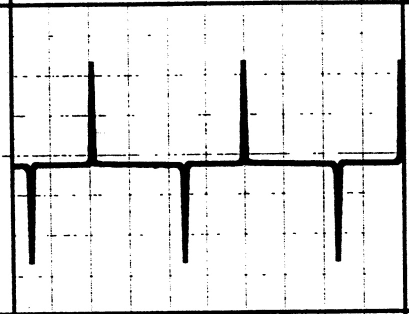
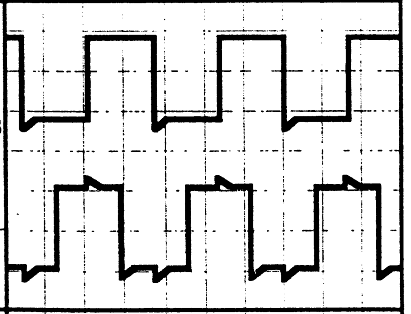
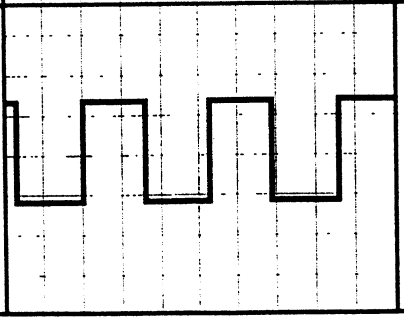
TEST LOCATION	WAVEFORM	MODE/LEVEL	TEST LOCATION	WAVEFORM	MODE/LEVEL
IC111 Pin 37		REC, EE 1 Vp-p	IC111 Pin 34		PB 2 Vp-p
IC111 Pin 3		REC, EE 0.6 Vp-p	IC111 Pin 34		REC, EE 2 Vp-p
IC111 Pin 4		REC, EE 0.5 Vp-p	IC111 (UPPER) Pin 34 (LOWER) Pin 33		STILL (UPPER) 2 Vp-p (LOWER) 5 Vp-p
IC111 Pin 5		REC, EE 1.2 Vp-p	IC111 Pin 15		REC, EE 0.7 Vp-p
IC111 Pin 40		REC, EE 1.0 Vp-p	IC111 Pin 15		PB 0.25 Vp-p
IC111 Pin 39		PB 0.3 Vp-p	IC111 Pin 25		PB 1.0 Vp-p
IC111 Pin 3		PB 0.5 Vp-p	IC111 Pin 31		PB 0.6 Vp-p
IC111 Pin 4		PB 0.5 Vp-p			
IC111 Pins 10/12		PB 0.3 Vp-p			


K
J
I
H
G
F
E
D
C
B
A
SV-A
LOADING MOTOR DRIVE
IC303
POWER DOWN DET
IC306 MM1381R
CN302
GND
SW DATA 1
SW DATA 0
SW DATA 2
ML (+)
ML (-)
DEW S
(TO MECHANISM)
CN303
GND
NC
SAFETY SW
S REEL P
SW 5V
T REEL P
(TO MECHANISM)
CN301
T TOP S
GND
T END S
GND
FL START SW
GND
(TO MECHANISM)
CN354
CTL HEAD -
CTL HEAD +
GND
(TO CTL HEAD)
CN352
D-PG
GND
D-FG
ALWAYS 13V(MH)
MH-VS
GND(MH)
(TO DRUM M)
CN353
MC-F/R
C-VS
FG2
GND
FG1
SW 5V
ALWAYS 13V(MCL)
GND(MC)
(TO CAPSTAN M)
CN304
GND
RESET
TRS BUSY
TRS DATA
RTS DATA
RTS CLK
RTS STRB
ALWAYS SV
TO CT-1 CN001
CN305
GND(MH)
GND(MC, ML)
POWER UP
AL 13V(MH)
AL 13V(MCL)
GND
ALWAYS 5.6V
SWD 12V
(TO POWER) CN512
LA7116
IC304
FG AMP
Q3004 AMP
2SC4640(S.T)
TP352 CTL P
T TOP S
DEW S
AVSS2
CTL SLOPE
CTL HEAD +
CTL HEAD -
CTL IN
CTL SIG OUT
CTL AMP IN
VREFC
AVSS1
AVDD1
CFG IN
CFG SIG OUT
CFG AMP IN
DPG IN
DFG IN
S REEL P
T REEL P
C SYNC
VD ENV
POWER DOWN
REMOTE
SW DATA 0
SW DATA 1
SW DATA 2
SAFETY SW
ALARM IN
AV REF
AVDD2
REC 12V DET(PAL)
EXT ADJ IN
DRC 0
DRC 1
DRC 2
TRS BUSY
FLD C SELECT
232C CLK/TM CLOCK ADJUST
232C DATA OUT
232C DATA IN
MH PWM
MC PWM
FLD CLOCK
FLD DATA OUT
FLD DATA IN
BACK UP 5V (VDD)
IC302 MM1381H RESET IC
ALL CLEAR
TP302
TP303 GND
REG. Q3002 2SC4483
REG. Q3017
REG. Q3001 2SC4483
REG. Q3003 2SC4483
REG. Q3005 2SC4483
TIMER
SVT-5
IC

(See page 4-36)


IC305
X24C02P-C7189
EEPROM
TO ADA
A MUTE
REC H
PB H
REC 12V DET
24H
12H
(See page 4-20)
TB LINE
AUDIO LINE
TO VDA
ORC MUTE
RF SW P
PB H
REC H
ROTARY
SPEC H
QV
C SYNC
H AMP SW
OSD CLK
OSD DATA
OSD CS
REC GATE
ENV SW
HEATER +
HEATER -
ALWAYS -23V
GND
(See page 4-14)
IC301
TIMER, SYSTEM CONTROL & SERVO
SVT-5050P:UPD78P4916G
SVT-1000P:UPD784915GF
2H DELAY SW
POWER UP
BUZZER
TIMER REC OUT
WARNING OUT
AD MUTE
DMSS CLK
EEPROM CLOCK
OSD/DMSS/EEPROM DATA
(VDD) BACK UP 5V
VSS
ML-S
ML-D
MC F/R
CAPSTAN START P
ORC MUTE
OSD CS
EXT ADJ OUT
OSD CLK
QVD
TO TMA
VD ENV
ORC DATA 2
ORC DATA 1
ORC DATA 0
EXT ADJ IN
EXT ADJ OUT
1SHOT REC IN
ALARM RESET
REMOTE IN
WARNING OUT
SW OUT
TIMER REC OUT
ALARM OUT
ALARM IN
BUZZER
EXT TIMER IN
SERIES IN
SERIES OUT
TAPE END OUT
SWD. 12V
ALWAYS 5.6V
GND(SY)
(See page 4-22, 4-24)
TO TM-1 CN711
CN306
1 FL HEATER -
2 FL HEATER +
3 FLD C SELECT
4 FLD CLOCK
5 ALWAYS 5.6V
6 FLD DATA(M-F)
7 FLD DATA(F-M)
8 BACK UP(GND)
9 GND
10 ALWAYS -23V
11 ALL CLEAR
12 TAPE END OUT
13 SERIES OUT
14 N.C
(TO TM1)
(See page 4-30)
LOGIC GATE
IC308
TC4030BP
RESET IC
Q3006 DTC144EK
VOLTAGE : REC (PLAY) MODE
NOTE NOT SPECIFIED DIODES:1SS133 or GMA01

SERVO CIRCUIT WAVEFORMS

TEST LOCATION	WAVEFORM	TEST LOCATION	WAVEFORM
IC301 PIN 9,10 REC/PB 2V/div. 5μs/div.		IC301 PIN 99 REC/PB 1V/div. 200ms/div.	
IC301 PIN 85 REC 2V/div. 10ms/div.		IC304 PIN 17, 22 REC/PB 200mV/div. 500μs/div.	
IC301 PIN 88 PB 500mV/div. 10ms/div.		IC304 UP: PIN 18 LOW: PIN23 REC/PB 2V/div. 200μs/div.	
IC301 PIN 93 REC/PB 2V/div. 100μs/div.			

WF-S-FE4Q

NOTE:

______: Common parts for SVT-5050P & SVT-1000P

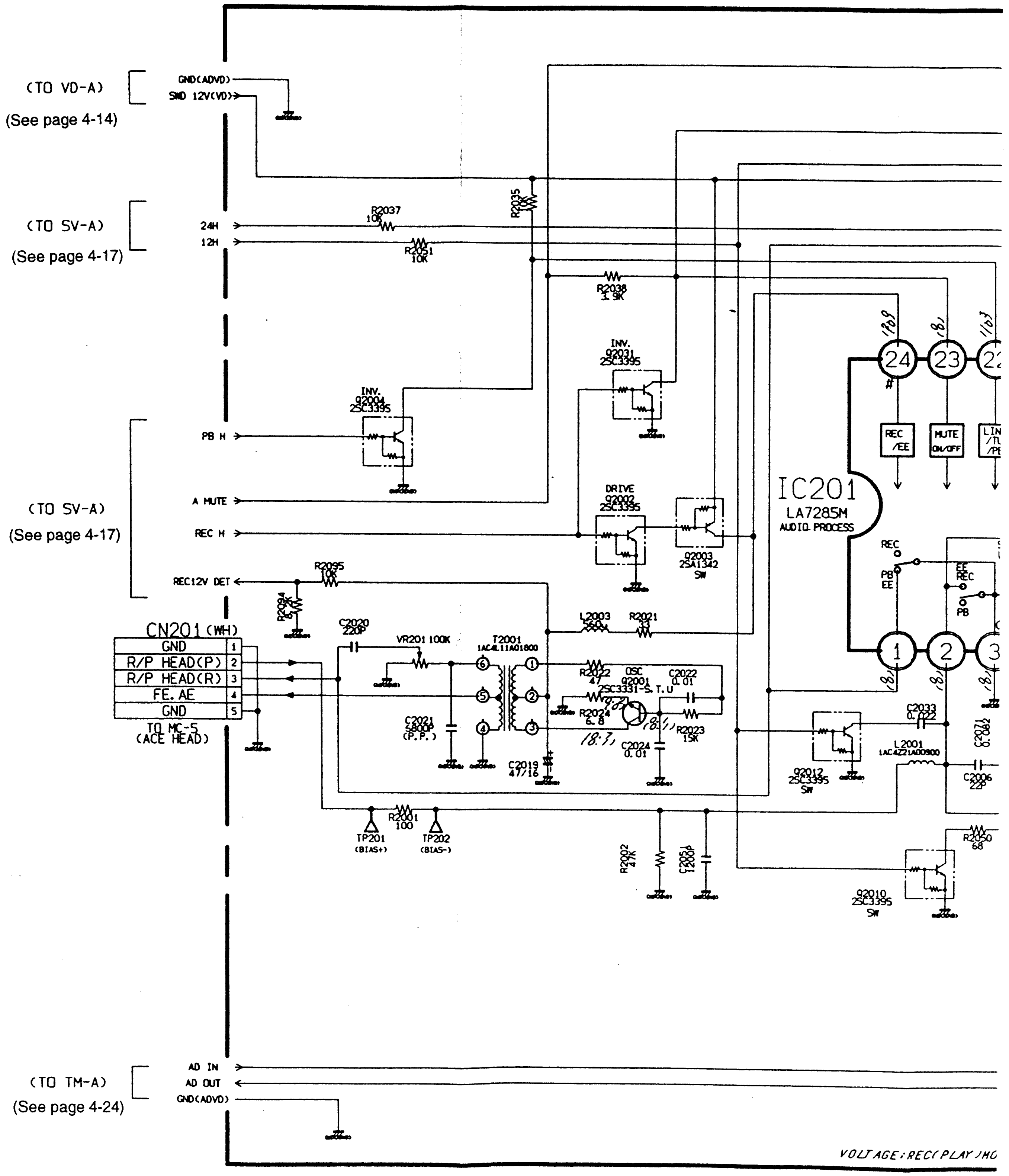
The parts marked ▨ is SVT-5050P.

IC301 SYSTEM/TIMER/TUNING CONTROL MPU PIN FUNCTION TABLE

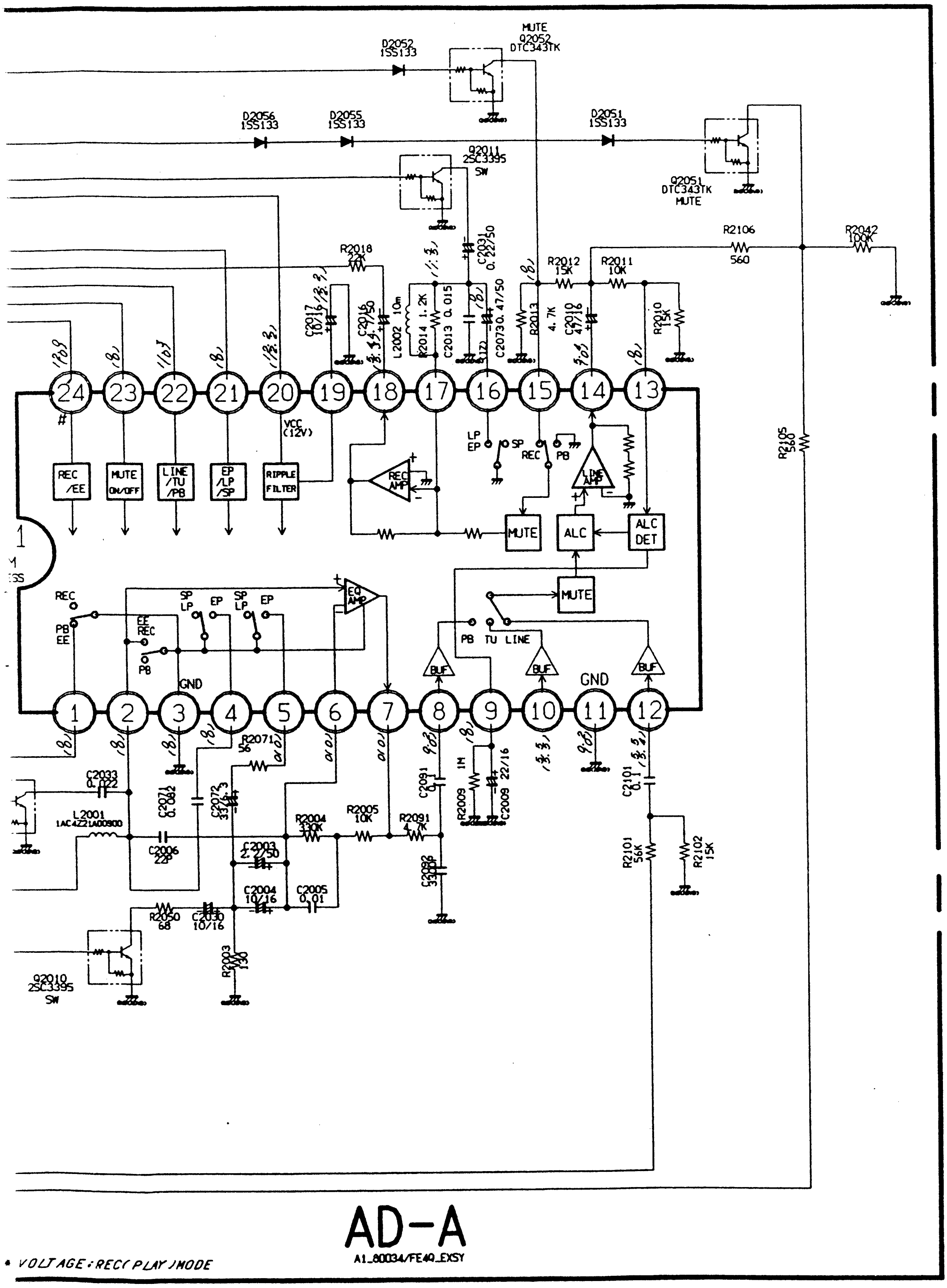
No.	Name	I/O	H/L	Signal Function
1	ORC0	O	-	Optimum picture control (ORC) data signal. Signal control to video recording current, EQ-amp characteristics, and PB picture frequency peaking.
2	ORC1	O	-	
3	ORC2	O	-	
4	TRS BUSY	-	-	NOT USE
5	FLD C SELECT	O	H	Chip select signal to FLD display control MPU.
6	232C CLK	O	-	Clock signal to 232C controal unit.
7	232C DATA OUT	O	-	Output data to 232C controal unit.
8	232C DATA IN	I	-	Input data from 232C controal unit.
9	MH PWM	O	-	Output of head drum motor servo control signal. (pulse with modulation "PWM" signal)
10	MC PWM	O	-	Output of capstan motor servo control signal. (pulse with modulation "PWM" signal)
11	FLD CLK	O	-	Clock output to FLD display control MPU.
12	FLD DATA OUT	O	-	Data output to FLD display control MPU.
13	FLD DATA IN	I	-	Data input from FLD display control MPU.
14	Vdd	-	-	IC power source pin. (5v)
15	XT1	-	-	IC timer clock OSC terminal. Frequency is 32KHz.
16	XT2	-	-	
17	Vss	-	-	Ground terminal.
18	X1	-	-	IC clock OSC terminal. Frequency is 8MHz.
19	X2	-	-	
20	RESET	I	L	IC initial reset pin. (reset when "LOW")
21	TEST/VPP	-	-	NOT USE
22	AUTO EDJ OUT	-	-	NOT USE
23	VOICE CHANGE	O	H	Signal to indicate "Audio filter" is ON.
24	RF SW P	I	-	Input of RF switching pulse created by head drum PG.
25	ALARM OUT	O	-	Signal to indicate ALARM REC mode.
26	PB H	O	H	Signal for indicating playback mode.
27	REC H	O	H	Signal for indicating recording mode.
28	SPECIAL H	O	H	Special playback mode (search, slow, still, etc..) indication signal.
29	ROTARY	O	-	Video head CH1/CH2 confirmation signal. (Used in the processing of image circuit color signals.)
30	H. AMP SW	O	-	Main head and sub head switching signal.
31	QVD	O	H	Quasi vertical synchronizing signal.
32	OSD CLK	O	-	Clock to control on screen display control IC.
33	EXT ADJ OUT	O	H	Timer clock adjust signal output.
34	OSD CS	O	H	Cs signal output to on screen display control IC.
35	ORC MUTE	O	H	MUTE while ORC detector is working.
36	CAP START PULSE	O	-	Capstan motor intermittent drive control pulse.
37	MC F/R	O	-	Capstan motor rotation direction (normal/reverse) indication signal. (reverse; "H")
38	ML - D	O	-	Loading motor rotation direction indication signal. (load "H", brake "M", unload "L")
39	ML - S	O	-	Loading motor rotation speed (high / medium / low) indication signal.
40	Vss	-	-	Ground terminal.
41	Vdd	-	-	IC power source pin. (5v)
42	COMMON DATA	O	-	Data signal for OSD, DMSS and EEPROM IC.
43	EEPROM CLK	O	-	Clock to EEPROM IC.
44	DMSS CLK	O	-	Clock to DMSS IC.
45	AD MUTE	O	H	Signal disable audio signal output.
46	WARNING OUT	O	L	Warning signal output pin.
47	TIMER REC OUT	O	L	Timer recording mode indication signal.
48	BUZZER	O	-	Buzzer drive signal.
49	POWER UP	O	H	Power source ON/OFF signal. ("H" when on)
50	2H DELAY SW	O	H	2H delay circuit control signal.
51	SW OUT	O	H	Output of signal to "SW OUT" external output pin.
52	REC GATE	O	L	Signal that indicates video head recording timing in the REC mode. Especially in the 24H mode.
53	H COMP	O	-	Pulse that corrects the number of drum rotations during 24H recording.
54	8H	O	H	Output "H" during recording or playback in the 8H mode.
55	24H	O	H	Output "H" during recording or playback in the 24H mode.
56	40H	O	H	Output "H" during recording or playback in the 40H mode.
57	CTL 0/1 IN	I	-	Control duty indication signal input.
58	NC	-	-	-
59	CFG 1	I	-	Capstan motor FG-1 pulse input (for capstan servo).
60	CFG 2	I	-	Capstan motor FG-2 pulse input (for capstan "slow").
61	POWER DOWN	I	L	Power failure detection terminal.
62	ENV SW	I	-	Output comparison signal for main head and sub head.
63	ALARM RESET IN	I	H	Signal to stop ALARM REC.
64	EXT TIMER IN	I	H	Signal to start TIMER REC.
65	1 SHOT REC IN	I	H	Signal to start 1SHOT REC.
66	SERIES REC IN	O	H	Control signal for series REC mode input.
67	EXT ADJ IN	I	H	Timer clock adjust signal input.
68	REC 12V DET	I	L	REC mode indication signal input.
69	AVdd	-	-	IC power source pin for analog circuitry. (5v)
70	AVref	-	-	Reference voltage power source pin for analog circuitry.
71	ALARM IN	I	H	ALARM REC signal input.
72	SAFETY SW	I	L	Terminal for detecting accidental erasure prevention tab of cassette tape.
73	FL START SW	I	L	Terminal for detecting the start of cassette loading or discharge by cassette mechanism .
74	SW DATA 2	I	L	Input of the three-bit signal that indicates mechanism operational position.
75	SW DATA 1	I	L	
76	SW DATA 0	I	L	
77	REMOTE	I	-	Remote control signal input.
78	POWER DOWN	I	L	Reference voltage pin for AD port. (1/2Vcc)
79	VD ENV	I	-	Video head envelope detection signal input for ATR function.
80	T. END S.	I	L	Sensor signal input for tape end detection.
81	T. TOP S.	I	L	Sensor signal input for tape beginning detection.
82	DEW S	I	H	Dew sensor input pin.
83	AVss	-	-	Ground pin for analog circuitry.
84	CTL SLOPE	-	-	NOT USE
85	CTL HEAD +	I/O	-	CTL pulse I/O
86	CTL HEAD -	I/O	-	CTL pulse I/O
87	CTL IN	-	-	CTL AMP feed back filter
88	CTL SIG OUT	O	-	CTL AMP OUT
89	CTL AMP IN	I	-	Input signal from CTL AMP
90	Vref	-	-	Reference voltage power source pin for servo circuitry.
91	AVss1	-	-	Ground terminal.
92	AVdd1	-	-	IC power source pin for analog circuitry. (5V)
93	CFG IN	I	-	Capstan motor FG pulse input.
94	CFG SIG OUT	-	-	NOT USE
95	CFG AMP IN	-	-	NOT USE
96	DPG IN	I	-	Head drum PG pulse input. (Used in servo control and to generate the switching pulse.)
97	DFG IN	I	-	Head drum FG pulse input. (for head servo)
98	S REEL P	I	-	Supply reel moving sensor input.
99	T REEL P	I	-	Take up reel moving sensor input.
100	C SYNC	I	-	Composite synchronizing signal input.

FE4Q_IC301

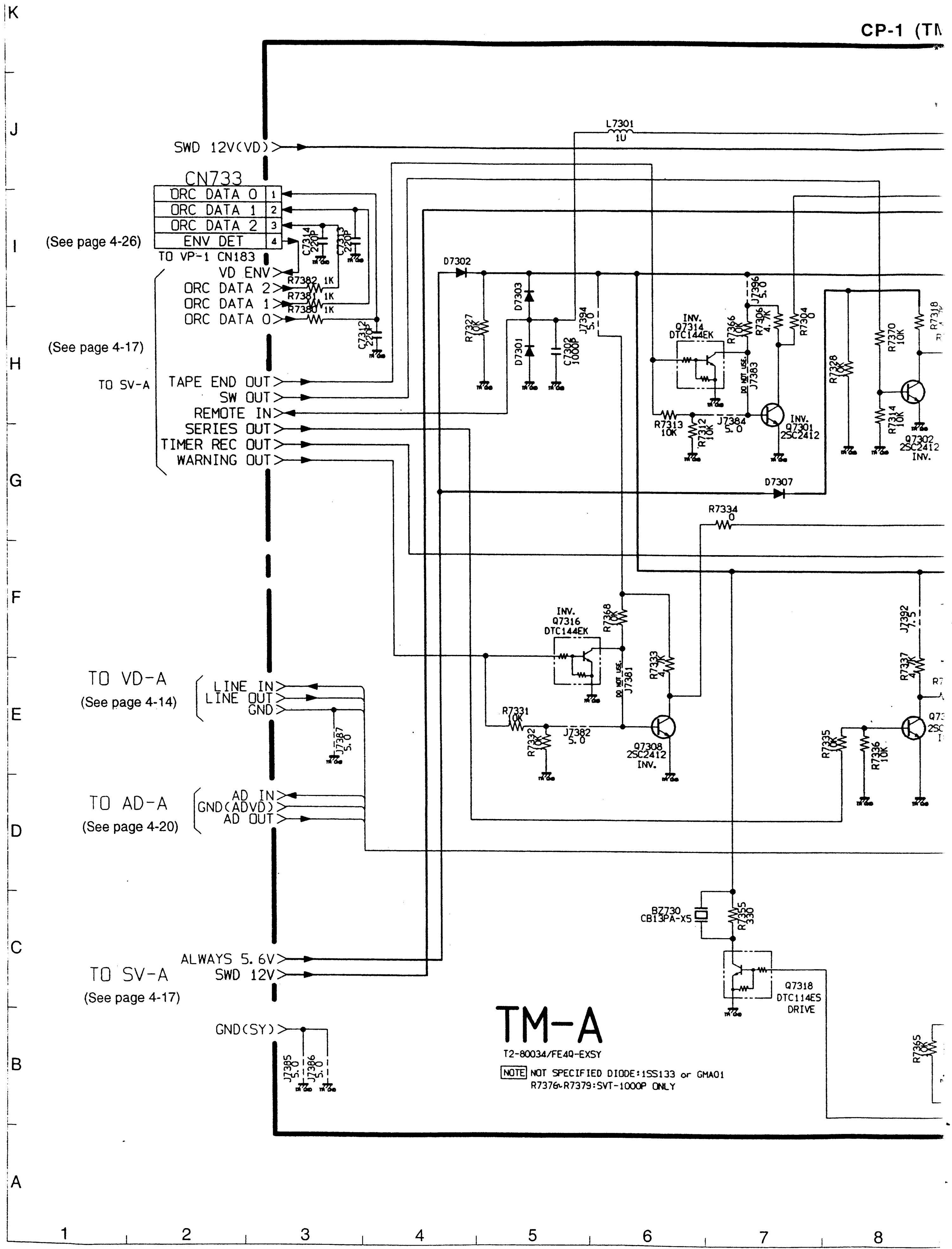
CP-1 (AD-A) A


(TO VD-A)
(See page 4-14)
GND(ADVD)
SWD 12V(VD)
(TO SV-A)
(See page 4-17)
24H
12H
R2037 10K
R2051 10K
R2035 10K
R2038 3.9K
PB H
INV. Q2004 2SC3395
INV. Q2031 2SC3395
(TO SV-A)
(See page 4-17)
A MUTE
REC H
DRIVE Q2002 2SC3395
Q2003 2SA1342 SW
REC12V DET
R2095 10K
R2094
IC201
LA7285M
AUDIO PROCESS
24
23
REC /EE
MUTE ON/OFF
REC
PB EE
EE REC
PB
CN201(WH)
GND 1
R/P HEAD(P) 2
R/P HEAD(R) 3
FE.AE 4
GND 5
TO MC-5 (ACE HEAD)
C2020 220P
VR201 100K
T2001 1AC4L11A01800
L2003 560μ
R2021 33
R2022 47
OSC Q2001 2SC3331-S.T.U
C2022 0.01
R2024 6.8
R2023 15K
C2021 5800P (P.P.)
C2019 47/16
C2024 0.01
(8.7)
(8.1)
C2033 0.022
L2001 1AC4Z21A00900
C2071 0.082
C2006 22P
Q2012 2SC3395 SW
1
2
3
TP201 (BIAS+)
TP202 (BIAS-)
R2001 100
R2002 47K
C2051 1200P
R2050 68
Q2010 2SC3395 SW
(TO TM-A)
(See page 4-24)
AD IN
AD OUT
GND(ADVD)
VOLTAGE: REC(PLAY)MO

CP-1 (AD-A) AUDIO


MUTE
Q2052
DTC343TK
D2052
1SS133
D2056
1SS133
D2055
1SS133
D2051
1SS133
Q2011
2SC3395
SW
Q2051
DTC343TK
MUTE
R2106
560
R2042
100K
R2018
22K
C2031
0.22/50
R2012
15K
R2011
10K
C2017
10/16
C2016
3.3/50
L2002 10m
R2014 1.2K
C2013 0.015
C2073 0.47/50
R2013
4.7K
C2010
47/16
R2010
15K
(8.9)
(8)
(10)
(8)
(12.2)
(12.2)
(3.3)
(1.3)
(8)
(8)
(5.4)
(8)
24
23
22
21
20
19
18
17
16
15
14
13
#
VCC
(12V)
REC
/EE
MUTE
ON/OFF
LINE
/TU
/PB
EP
/LP
/SP
RIPPLE
FILTER
REC
AMP
LP
EP
SP
REC
PB
LINE
AMP
MUTE
ALC
ALC
DET
R2105
560
REC
PB
EE
EE
REC
PB
SP
LP
EP
SP
LP
EP
EQ
AMP
MUTE
PB
TU
LINE
BUF
BUF
BUF
GND
GND
1
2
3
4
5
6
7
8
9
10
11
12
(8)
(8)
(8)
(8)
(0)
(0)
(0)
(9.8)
(8)
(3.3)
(9.8)
(3.5)
R2071
56
C2033
0.022
C2071
0.082
C2072
33/6.3
L2001
1AC4Z21A00900
C2006
22P
R2004
330K
R2005
10K
R2091
4.7K
C2091
0.1
R2009
1M
C2009
22/16
C2101
0.1
R2101
56K
R2102
15K
C2003
2.2/50
C2092
330P
C2004
10/16
C2005
0.01
R2050
68
C2030
10/16
R2003
150
Q2010
2SC3395
SW
AD-A
A1_80034/FE40_EXSY
• VOLTAGE: REC(PLAY)MODE

16 17 18 19 20 21 22 23

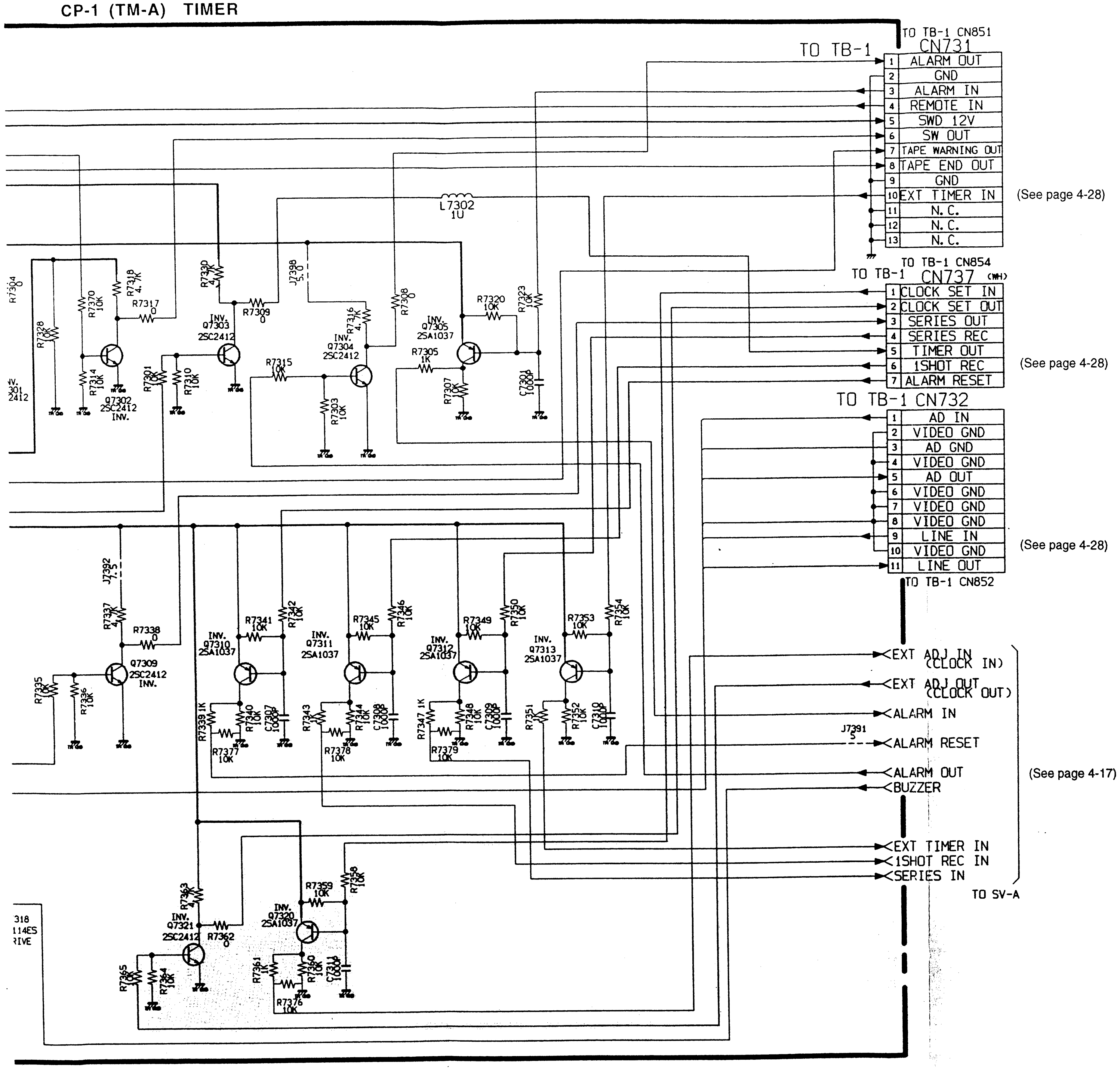

K
J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
SWD 12V(VD)
CN733
ORC DATA 0
ORC DATA 1
ORC DATA 2
ENV DET
1
2
3
4
TO VP-1 CN183
(See page 4-26)
C7314 220P
C7313 220P
VD ENV
ORC DATA 2
ORC DATA 1
ORC DATA 0
R7382 1K
R7381 1K
R7380 1K
C7312 220P
(See page 4-17)
TO SV-A
TAPE END OUT
SW OUT
REMOTE IN
SERIES OUT
TIMER REC OUT
WARNING OUT
L7301 1U
D7302
D7303
D7301
R7327 10K
C7302 1000P
J7394 5.0
INV. Q7314 DTC144EK
R7366 10K
J7396 5.0
R7306 4.7K
R7304 0
DO NOT USE. J7383
R7313 10K
R7312 10K
J7384 5.0
INV. Q7301 2SC2412
R7328 10K
R7370 10K
R7314 10K
R7318
Q7302 2SC2412 INV.
D7307
R7334 0
INV. Q7316 DTC144EK
R7368 10K
R7333 4.7K
DO NOT USE. J7381
R7331 10K
R7332 10K
J7382 5.0
Q7308 2SC2412 INV.
J7392 7.5
R7337 4.7K
R7335 10K
R7336 10K
Q73
2SC
TO VD-A
(See page 4-14)
LINE IN
LINE OUT
GND
J7387 5.0
TO AD-A
(See page 4-20)
AD IN
GND(ADVD)
AD OUT
BZ730 CB13PA-X5
R7355 330
Q7318 DTC114ES DRIVE
ALWAYS 5.6V
SWD 12V
TO SV-A
(See page 4-17)
GND(SY)
J7385 5.0
J7386 5.0
R7365

TM-A

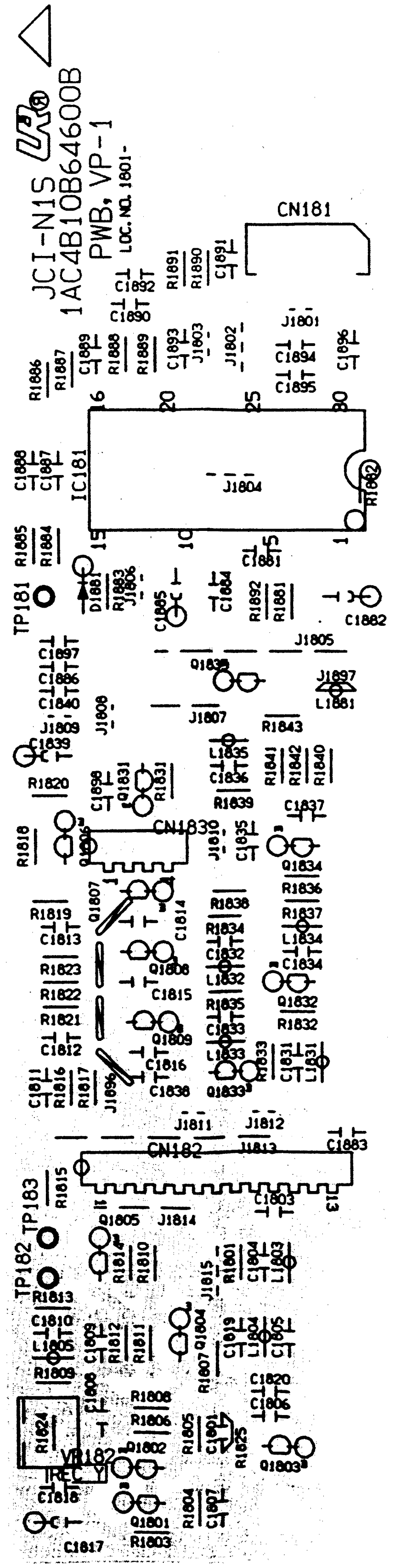
T2-80034/FE4Q-EXSY

NOTE NOT SPECIFIED DIODE:1SS133 or GMA01
R7376~R7379:SVT-1000P ONLY

CP-1 (TM-A) TIMER


TO TB-1 CN851
TO TB-1
CN731
1 ALARM OUT
2 GND
3 ALARM IN
4 REMOTE IN
5 SWD 12V
6 SW OUT
7 TAPE WARNING OUT
8 TAPE END OUT
9 GND
10 EXT TIMER IN
11 N.C.
12 N.C.
13 N.C.
(See page 4-28)
TO TB-1 CN854
TO TB-1
CN737 (WH)
1 CLOCK SET IN
2 CLOCK SET OUT
3 SERIES OUT
4 SERIES REC
5 TIMER OUT
6 1SHOT REC
7 ALARM RESET
(See page 4-28)
TO TB-1 CN732
1 AD IN
2 VIDEO GND
3 AD GND
4 VIDEO GND
5 AD OUT
6 VIDEO GND
7 VIDEO GND
8 VIDEO GND
9 LINE IN
10 VIDEO GND
11 LINE OUT
TO TB-1 CN852
(See page 4-28)
EXT ADJ IN (CLOCK IN)
EXT ADJ OUT (CLOCK OUT)
ALARM IN
ALARM RESET
ALARM OUT
BUZZER
(See page 4-17)
EXT TIMER IN
1SHOT REC IN
SERIES IN
TO SV-A
L7302 1U
J7398 5.0
J7392 7.5
J7391 5
INV. Q7303 2SC2412
INV. Q7304 2SC2412
INV. Q7305 2SA1037
Q7302 2SC2412 INV.
Q7309 2SC2412 INV.
INV. Q7310 2SA1037
INV. Q7311 2SA1037
INV. Q7312 2SA1037
INV. Q7313 2SA1037
INV. Q7321 2SC2412
INV. Q7320 2SA1037
C7301 1000P
C7307 1000P
C7308 1000P
C7309 1000P
C7310 1000P
C7311 1000P

VP-1 P.W.B.

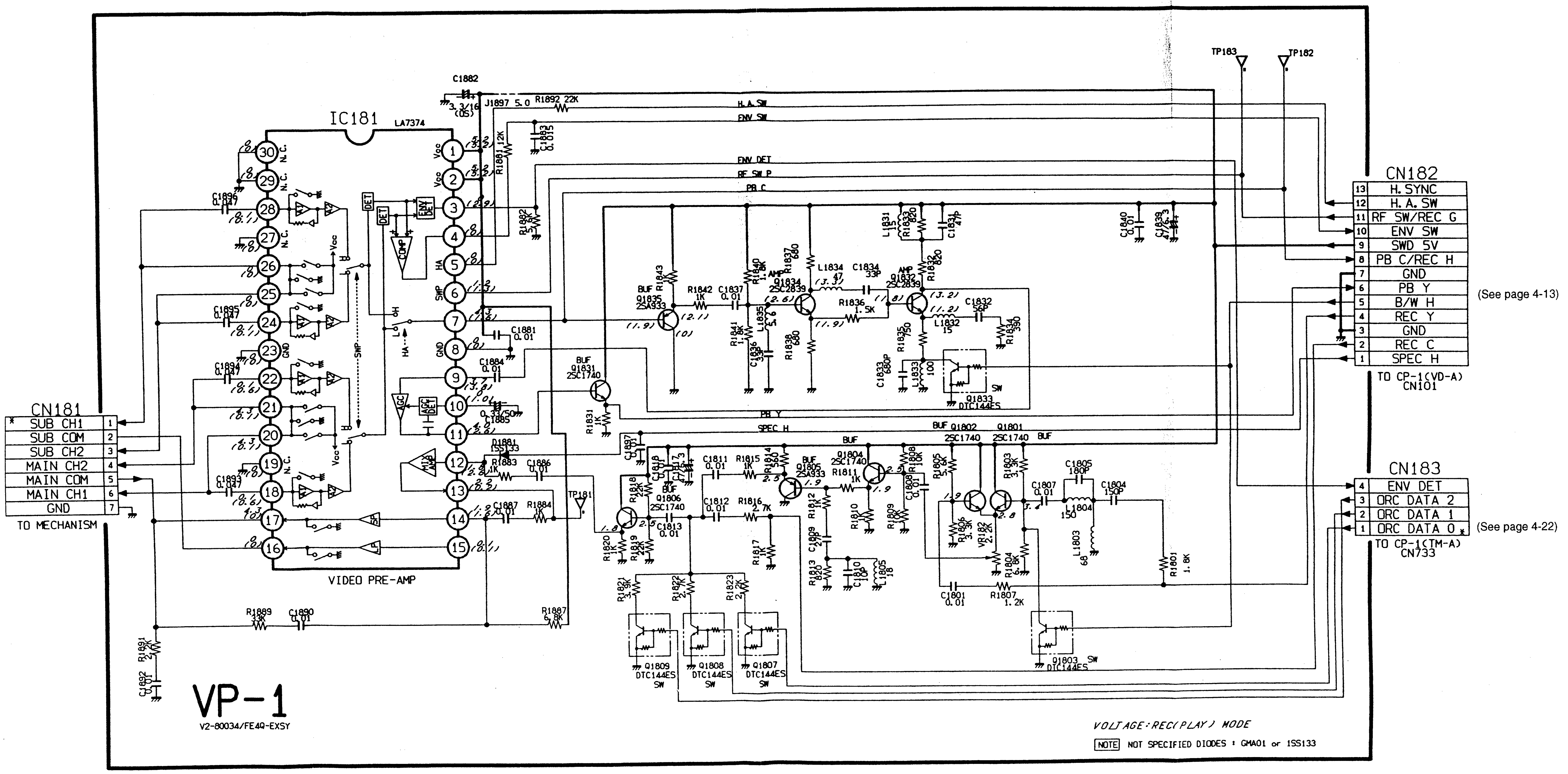

JCI-N1S
1AC4B10B64600B
PWB, VP-1
LOC. NO. 1801-
CN181
IC181
CN182
TP181
TP182
TP183
VR182 REC Y

NOTE:

______: Common parts for SVT-5050P & SVT-1000P

The parts marked is SVT-5050P.

VP-1 BOARD VIDEO PRE-AMP


IC181
LA7374
VIDEO PRE-AMP
Vcc
GND
N.C.
DET
ENV DET
COMP
AGC
AGC DET
MIX AMP
HA
SWP
CN181
SUB CH1
SUB COM
SUB CH2
MAIN CH2
MAIN COM
MAIN CH1
GND
TO MECHANISM
CN182
H.SYNC
H.A.SW
RF SW/REC G
ENV SW
SWD 5V
PB C/REC H
GND
PB Y
B/W H
REC Y
GND
REC C
SPEC H
TO CP-1(VD-A) CN101
CN183
ENV DET
ORC DATA 2
ORC DATA 1
ORC DATA 0
TO CP-1(TM-A) CN733
TP183
TP182
TP181
H.A.SW
ENV SW
ENV DET
RF SW P
PB C
PB Y
SPEC H
C1882
3.3/16 (OS)
J1897 5.0
R1892 22K
R1881 12K
C1883 0.015
R1882
C1881 0.01
C1884 0.01
C1885 0.33/50
D1881 1SS133
R1883 1K
C1886 0.01
C1887 0.01
R1884 1K
C1893 0.047
C1894 0.047
C1895 0.047
C1896 0.047
R1889 33K
C1890 0.01
R1887 6.8K
R1891 2.7K
C1892 0.01
BUF Q1831 2SC1740
R1831 1K
BUF Q1835 2SA933
R1843
R1842 1K
C1837 0.01
R1840
R1841
L1835 5.6
C1836
AMP Q1834 2SC2839
R1837 680
R1838 680
L1834 47
C1834 33P
R1836 1.5K
L1831 15
R1833 820
C1831 47P
R1832 820
AMP Q1832 2SC2839
C1832 56P
L1832 15
R1834 390
R1835 750
C1833 680P
L1833 100
Q1833 DTC144ES
SW
C1840 0.01
C1839 47/6.3
BUF Q1806 2SC1740
R1818 22K
R1820 1K
R1819 22K
C1818 0.01
C1817 47/6.3
C1813 0.01
C1811 0.01
R1815 1K
C1812 0.01
R1816 2.7K
R1817
R1814 560
BUF Q1805 2SA933
R1812 1K
C1809 27P
R1813 820
C1810
L1805 18
R1810
BUF Q1804 2SC1740
R1811 1K
R1809
R1808
C1808 0.01
BUF Q1802 2SC1740
Q1801 2SC1740 BUF
R1805
R1806 3.3K
VR182 2.2K
R1803 3.3K
R1804 6.8K
C1807 0.01
C1805 180P
L1804 150
C1804 150P
L1803 68
R1801 1.8K
C1801 0.01
R1807 1.2K
R1821 3.9K
R1822 2.7K
R1823 2.2K
Q1809 DTC144ES SW
Q1808 DTC144ES SW
Q1807 DTC144ES SW
Q1803 DTC144ES SW
VP-1
V2-80034/FE4Q-EXSY

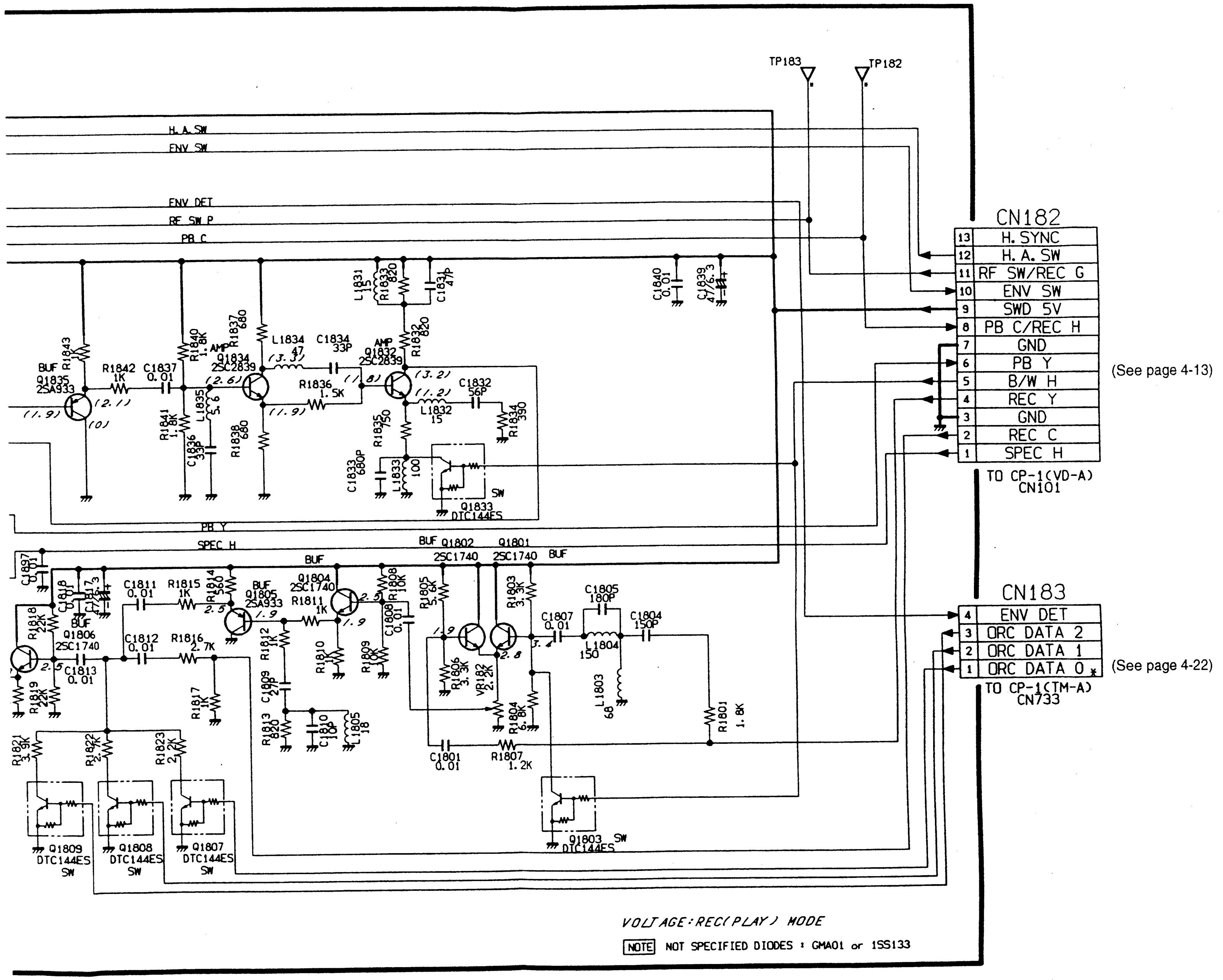
(See page 4-13)

(See page 4-22)

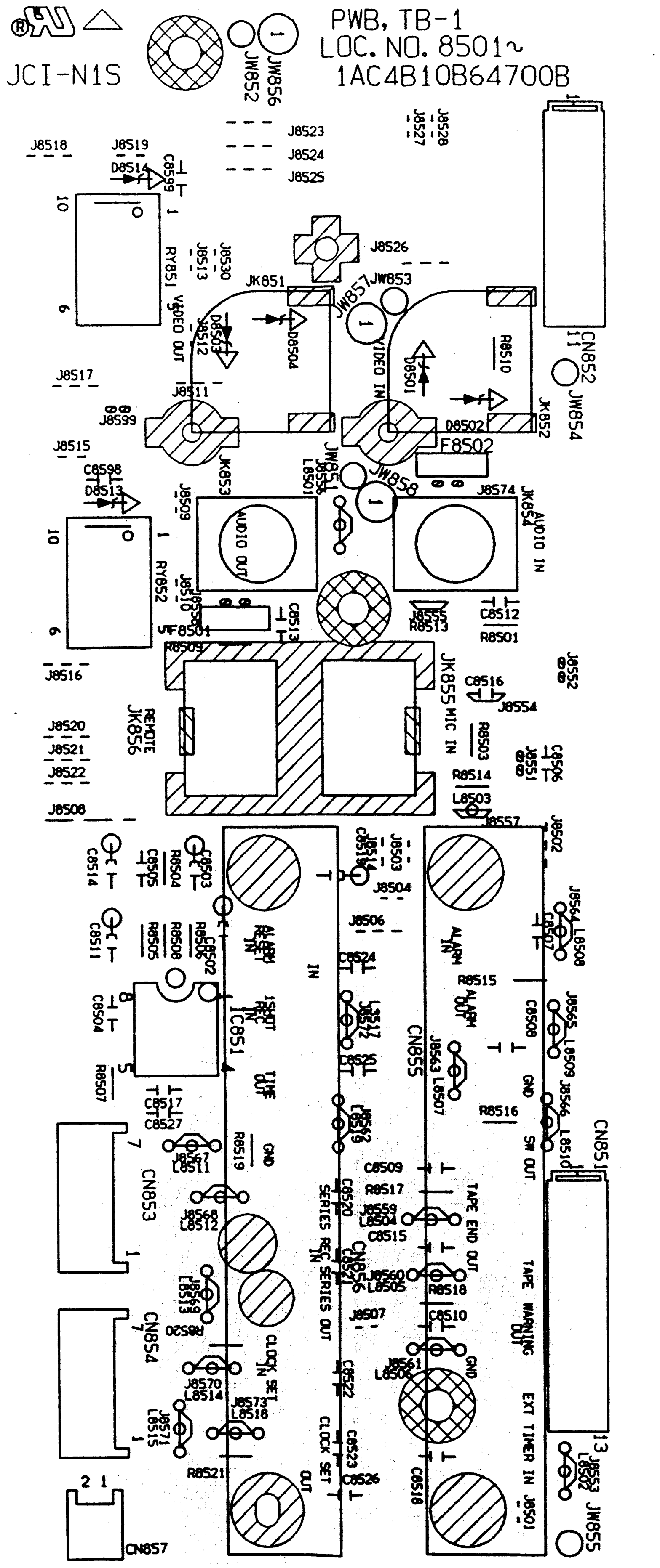
VOLTAGE: REC(PLAY) MODE

NOTE NOT SPECIFIED DIODES : GMA01 or 1SS133

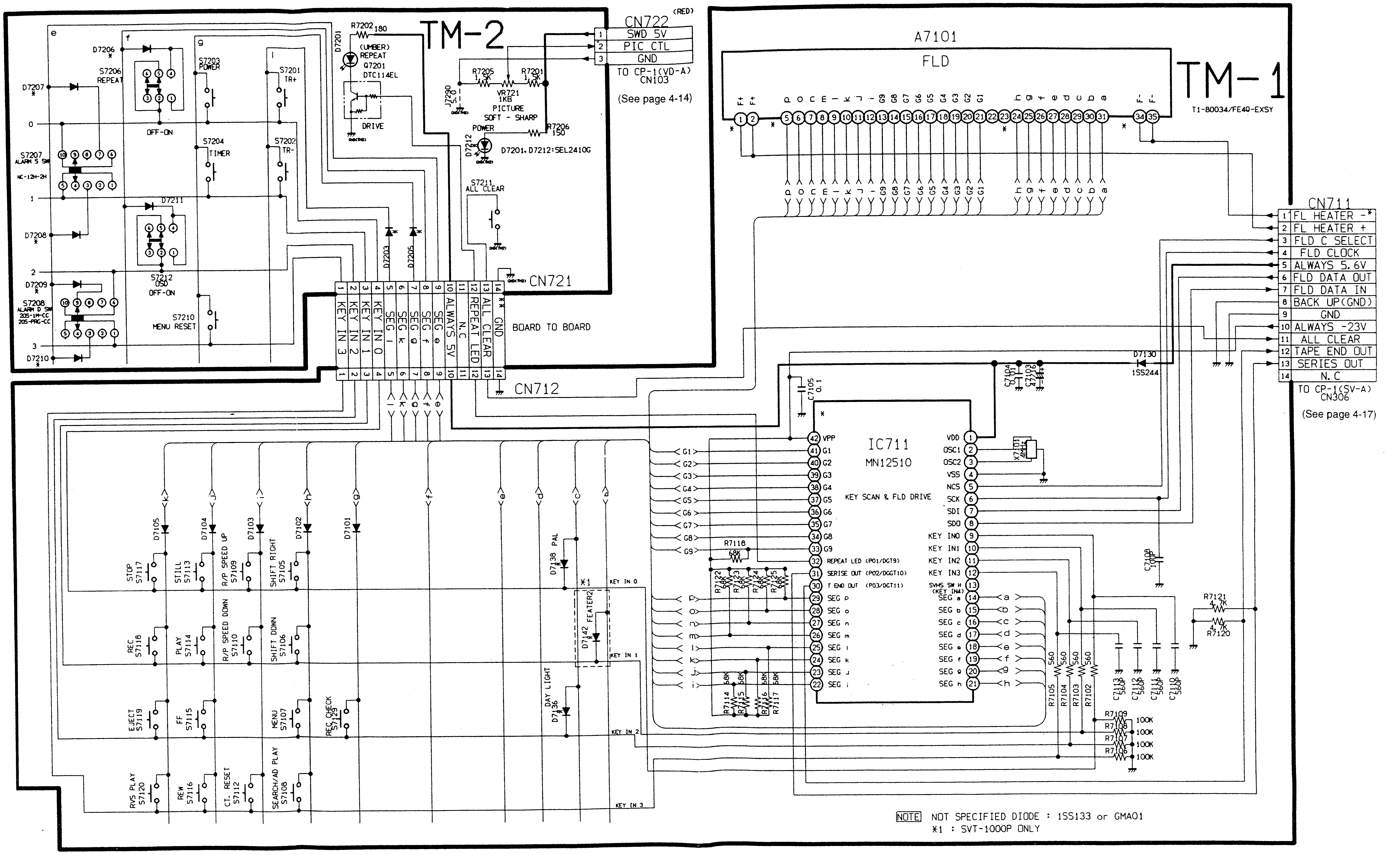
VP-1 BOARD VIDEO PRE-AMP


H.A.SW
ENV SW
ENV DET
RF SW P
PB C
TP183
TP182
CN182
13 H.SYNC
12 H.A.SW
11 RF SW/REC G
10 ENV SW
9 SWD SV
8 PB C/REC H
7 GND
6 PB Y
5 B/W H
4 REC Y
3 GND
2 REC C
1 SPEC H
TO CP-1(VD-A) CN101
(See page 4-13)
CN183
4 ENV DET
3 ORC DATA 2
2 ORC DATA 1
1 ORC DATA 0 *
TO CP-1(TM-A) CN733
(See page 4-22)
BUF Q1835 2SA933
AMP Q1834 2SC2839
AMP Q1832 2SC2839
Q1833 DTC144ES SW
PB Y
SPEC H
BUF Q1802 2SC1740
Q1801 2SC1740 BUF
BUF Q1804 2SC1740
BUF Q1805 2SA933
BUF Q1806 2SC1740
Q1809 DTC144ES SW
Q1808 DTC144ES SW
Q1807 DTC144ES SW
Q1803 DTC144ES SW
VR182 2.2K
VOLTAGE: REC(PLAY) MODE
NOTE NOT SPECIFIED DIODES : GMA01 or 1SS133

TB-1 P.W.B.


JCI-N1S
PWB, TB-1
LOC. NO. 8501~
1AC4B10B64700B
JW856
JW852
RY851
RY852
JK851 VIDEO OUT
JK852 VIDEO IN
JK853 AUDIO OUT
JK854 AUDIO IN
JK855 MIC IN
JK856 REMOTE
CN852
CN851
CN853
CN854
CN855
CN857
IC851
F8501
F8502
ALARM RESET IN
ALARM OUT
1SHOT REC IN
TIME OUT
SERIES REC IN
SERIES OUT
CLOCK SET IN
CLOCK SET OUT
SW OUT
TAPE END OUT
TAPE WARNING OUT
EXT TIMER IN
GND

TM-1, 2 BOARD TIMER, DISPLAY (FLD) & SWITCH


TM-2
TM-1
CN722 (RED)
1 SWD 5V
2 PIC CTL
3 GND
TO CP-1(VD-A) CN103
(See page 4-14)
R7202 180
D7201
(UMBER) REPEAT
Q7201 DTC114EL
DRIVE
R7205 1.5K
R7201 1.5K
VR721 1KB PICTURE SOFT - SHARP
J7290 5.0
POWER
R7206 150
D7212
D7201, D7212:SEL2410G
S7211 ALL CLEAR
D7206
S7206 REPEAT
D7207
S7207 ALARM S SW
D7208
D7209
S7208 ALARM D SW
D7210
S7203 POWER
S7201 TR+
S7204 TIMER
S7202 TR-
OFF-ON
D7211
S7212 OSD OFF-ON
S7210 MENU RESET
D7203
D7205
CN721
BOARD TO BOARD
KEY IN 3
KEY IN 2
KEY IN 1
KEY IN 0
SEG l
SEG k
SEG g
SEG f
SEG e
ALWAYS 5V
N.C
REPEAT LED
ALL CLEAR
GND
CN712
A7101
FLD
T1-80034/FE40-EXSY
CN711
1 FL HEATER -
2 FL HEATER +
3 FLD C SELECT
4 FLD CLOCK
5 ALWAYS 5.6V
6 FLD DATA OUT
7 FLD DATA IN
8 BACK UP(GND)
9 GND
10 ALWAYS -23V
11 ALL CLEAR
12 TAPE END OUT
13 SERIES OUT
14 N.C
TO CP-1(SV-A) CN306
(See page 4-17)
D7130 1SS244
C7105 0.1
C7104 0.1
C7103 47/6.3
IC711 MN12510
KEY SCAN & FLD DRIVE
VPP
VDD
OSC1
OSC2
VSS
NCS
SCK
SDI
SDO
KEY IN0
KEY IN1
KEY IN2
KEY IN3
SVHS SW H (KEY IN4)
REPEAT LED (P01/DGT9)
SERISE OUT (P02/DGT10)
T END OUT (P03/DGT11)
SEG a
SEG b
SEG c
SEG d
SEG e
SEG f
SEG g
SEG h
SEG p
SEG o
SEG n
SEG m
SEG l
SEG k
SEG j
SEG i
X7101 4MHz
C7108 100P
R7118 68K
R7122 68K
R7123 68K
R7124 68K
R7125 68K
R7114 68K
R7115 68K
R7116 68K
R7117 68K
R7105 560
R7104 560
R7103 560
R7102 560
C7113 560P
C7112 560P
C7111 560P
C7110 560P
R7109 100K
R7108 100K
R7107 100K
R7106 100K
R7121 4.7K
R7120 4.7K
D7105
D7104
D7103
D7102
D7101
STOP S7117
STILL S7113
R/P SPEED UP S7109
SHIFT RIGHT S7105
REC S7118
PLAY S7114
R/P SPEED DOWN S7110
SHIFT DOWN S7106
EJECT S7119
FF S7115
MENU S7107
REC CHECK S7121
RVS PLAY S7120
REW S7116
CT. RESET S7112
SEARCH/AD PLAY S7108
D7138 PAL
*1
D7142 FEATER2
DAY LIGHT D7136
KEY IN 0
KEY IN 1
KEY IN 2
KEY IN 3

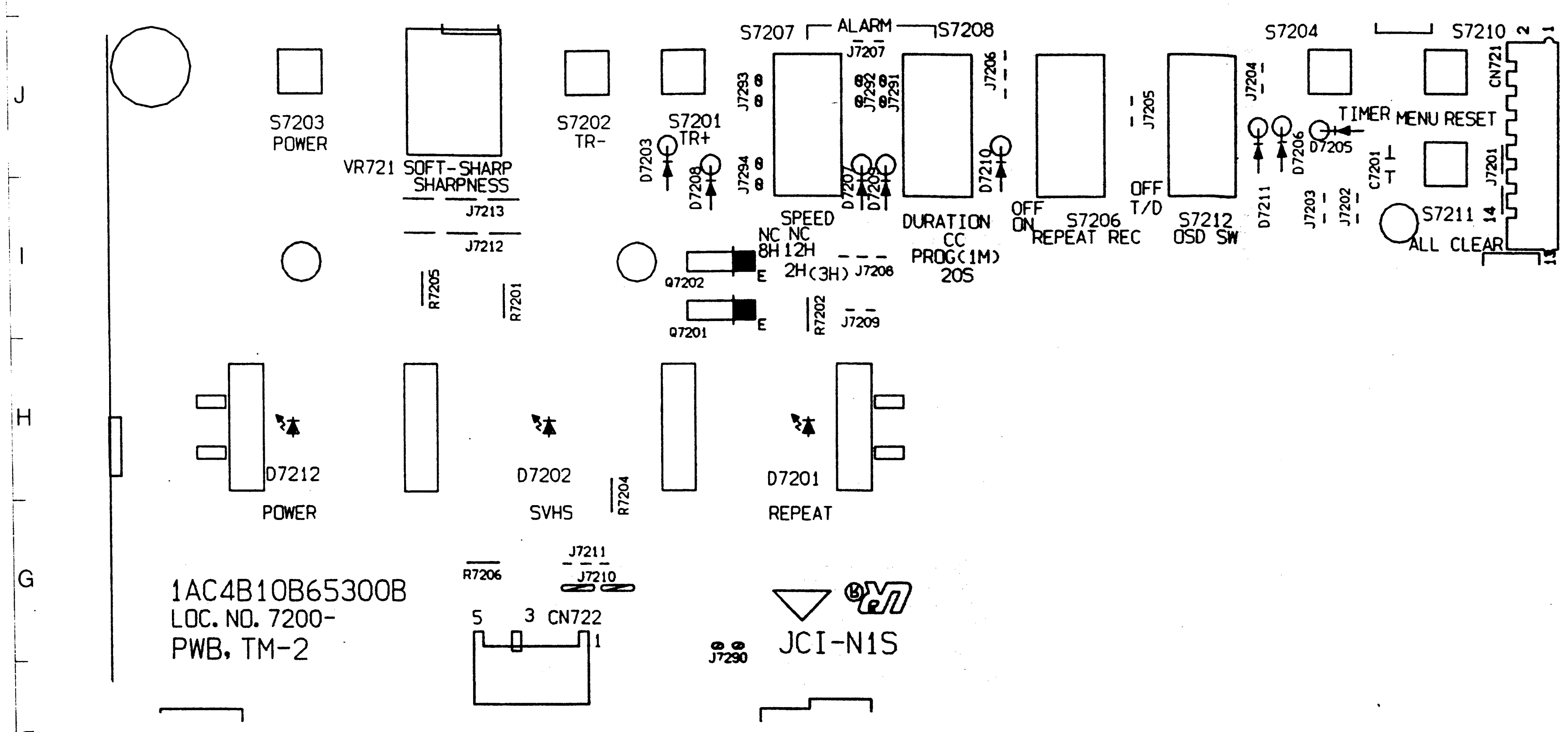
(See page 4-24)

(See page 4-24)

(See page 4-24)

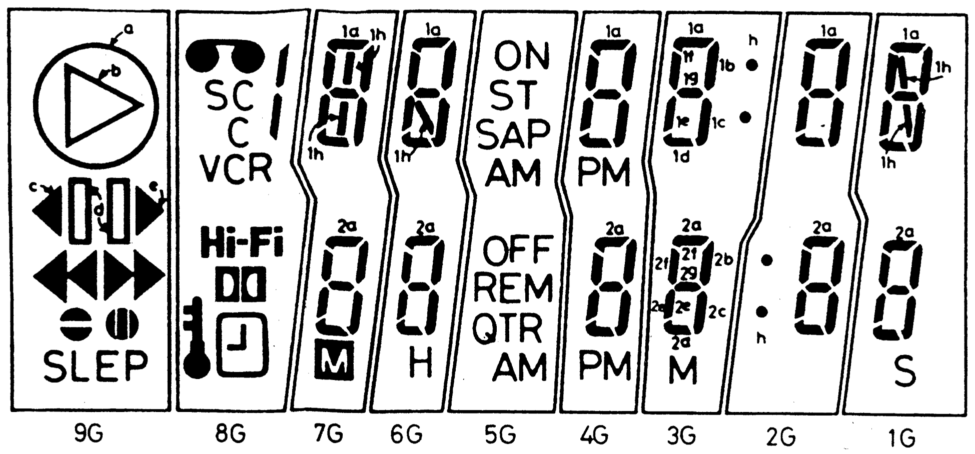
NOTE NOT SPECIFIED DIODE : 1SS133 or GMA01
*1 : SVT-1000P ONLY

TM-2 P.W.B.



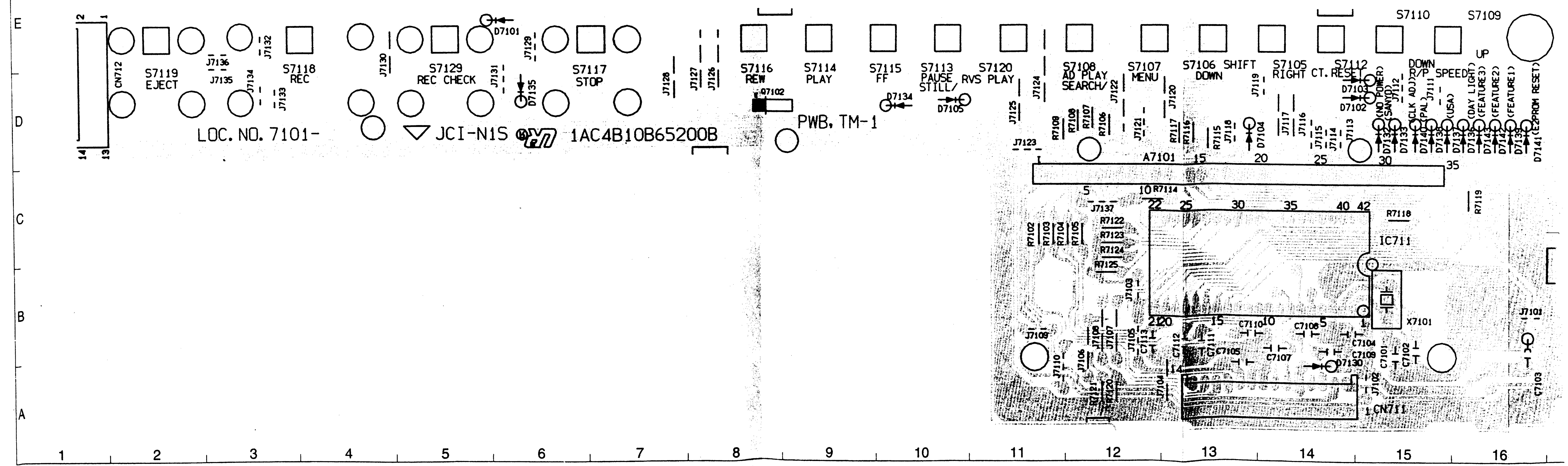
S7207
ALARM
S7208
J7207
S7204
S7210
CN721
S7203
POWER
VR721 SOFT-SHARP
SHARPNESS
S7202
TR-
S7201
TR+
TIMER
MENU RESET
D7203
D7208
D7205
J7213
J7212
SPEED
NC NC
8H 12H
2H (3H)
DURATION
CC
PROG (1M)
20S
OFF
ON
S7206
REPEAT REC
OFF
T/D
S7212
OSD SW
S7211
ALL CLEAR
Q7202
Q7201
J7206
J7208
J7209
R7202
R7205
R7201
D7212
POWER
D7202
SVHS
R7204
D7201
REPEAT
1AC4B10B65300B
LOC. NO. 7200-
PWB. TM-2
R7206
J7211
J7210
5
3
CN722
1
J7290
JCI-N1S

A7101 DISPLAY (FLD) GRID/ANO



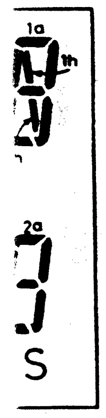
SC
C
VCR
Hi-Fi
SLEP
ON
ST
SAP
AM
OFF
REM
QTR
AM
PM
PM
M
H
M
S
9G
8G
7G
6G
5G
4G
3G
2G
1G

TM-1 P.W.B.



S7110
S7109
UP
CN712
S7119
EJECT
J7136
J7135
J7134
J7133
J7132
S7118
REC
D7101
J7130
S7129
REC CHECK
J7131
D7135
J7129
S7117
STOP
J7128
J7127
J7126
S7116
REW
Q7102
S7114
PLAY
S7115
FF
D7134
S7113
PAUSE
STILL/
D7105
S7120
RVS PLAY
J7124
J7125
S7108
AD PLAY
SEARCH/
S7107
MENU
S7106 SHIFT
DOWN
S7105
RIGHT
S7112
CT. RESET
DOWN
R/P SPEED
D7103
D7102
(NO POWER)
(SANYO)
CLK ADJ
(PAL)
(USA)
(DAY LIGHT)
(FEATURE3)
(FEATURE2)
(FEATURE1)
(EEPROM RESET)
LOC. NO. 7101-
JCI-N1S
1AC4B10B65200B
PWB. TM-1
J7123
A7101
R7114
J7137
R7122
R7123
R7124
R7125
R7118
R7119
IC711
X7101
J7101
J7109
D7130
CN711
C7103
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

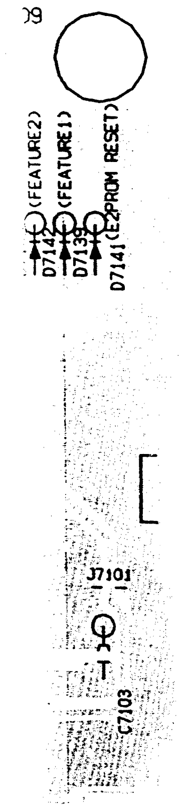
GRID/ANODE ASSIGNMENT DRAWING & TABLE



	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	○	●●	1a	1a	ON	1a	1a	1a	1a
b	▷	SC	1b	1b	ST	1b	1b	1b	1b
c	◀	/	1c	1c	SAP	1c	1c	1c	1c
d	▯▯	C	1d	1d	AM	1d	1d	1d	1d
e	▶	VCR	1e	1e	╱	1e	1e	1e	1e
f	╱	╱	1f	1f	╱	1f	1f	1f	1f
g	╱	╱	1g	1g	╱	1g	1g	1g	1g
h	╱	╱	1h	1h	╱	PM	:	:	1h
i	◀◀	DD	2a	2a	OFF	2a	2a	2a	2a
j	▶▶	Hi-Fi	2b	2b	REM	2b	2b	2b	2b
k	⊖	🌡	2c	2c	QTR	2c	2c	2c	2c
l	◍	◷	2d	2d	AM	2d	2d	2d	2d
m	S		2e	2e	╱	2e	2e	2e	2e
n	L		2f	2f	╱	2f	2f	2f	2f
o	E		2g	2g	╱	2g	2g	2g	2g
p	P		M	H	╱	PM	M	╱	S

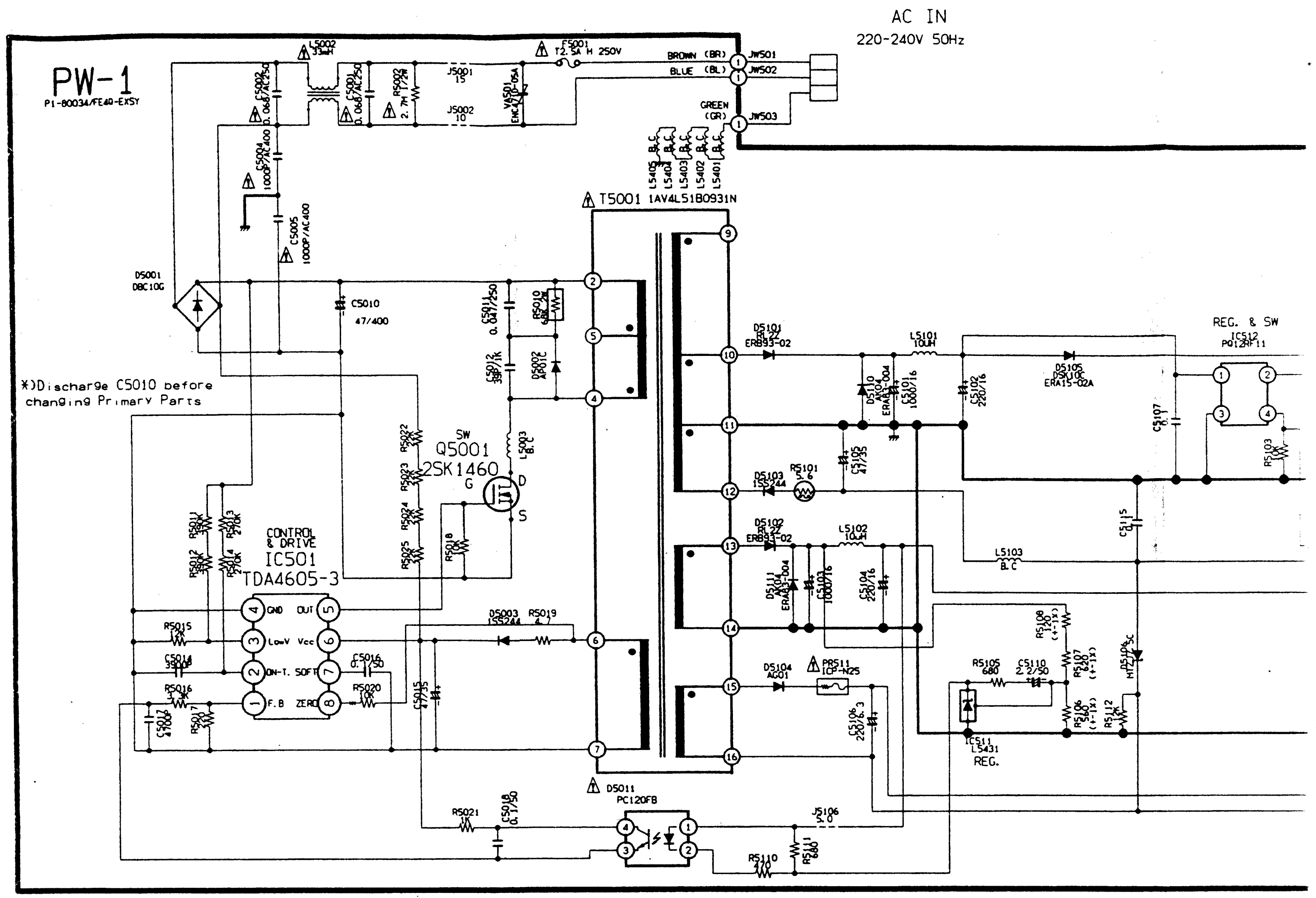
← Grid

↑ Segment

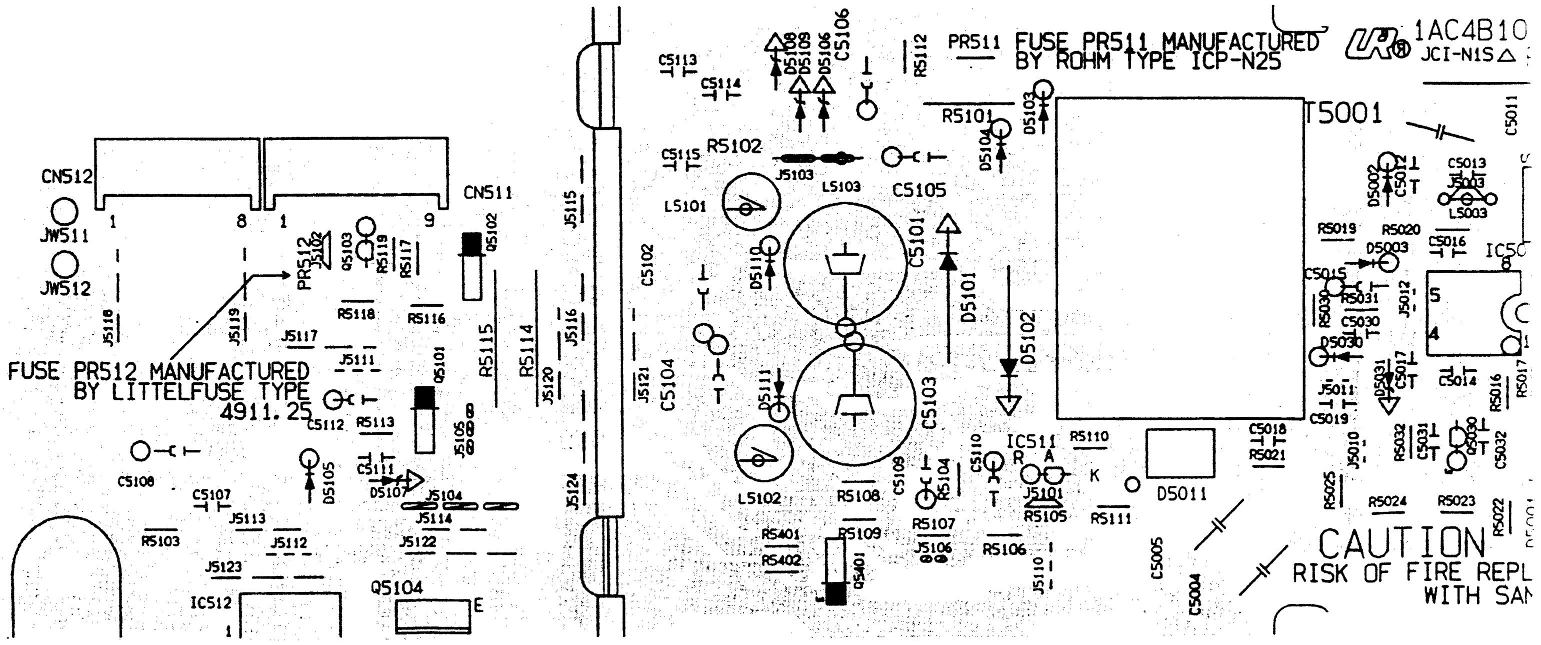

09
(FEATURE2)
(FEATURE1)
(E2PROM RESET)
D7142
D7139
D7141
J7101
C7103

16 17 18 19 20 21 22 23

PW-1 BOARD POWER SUPPLY

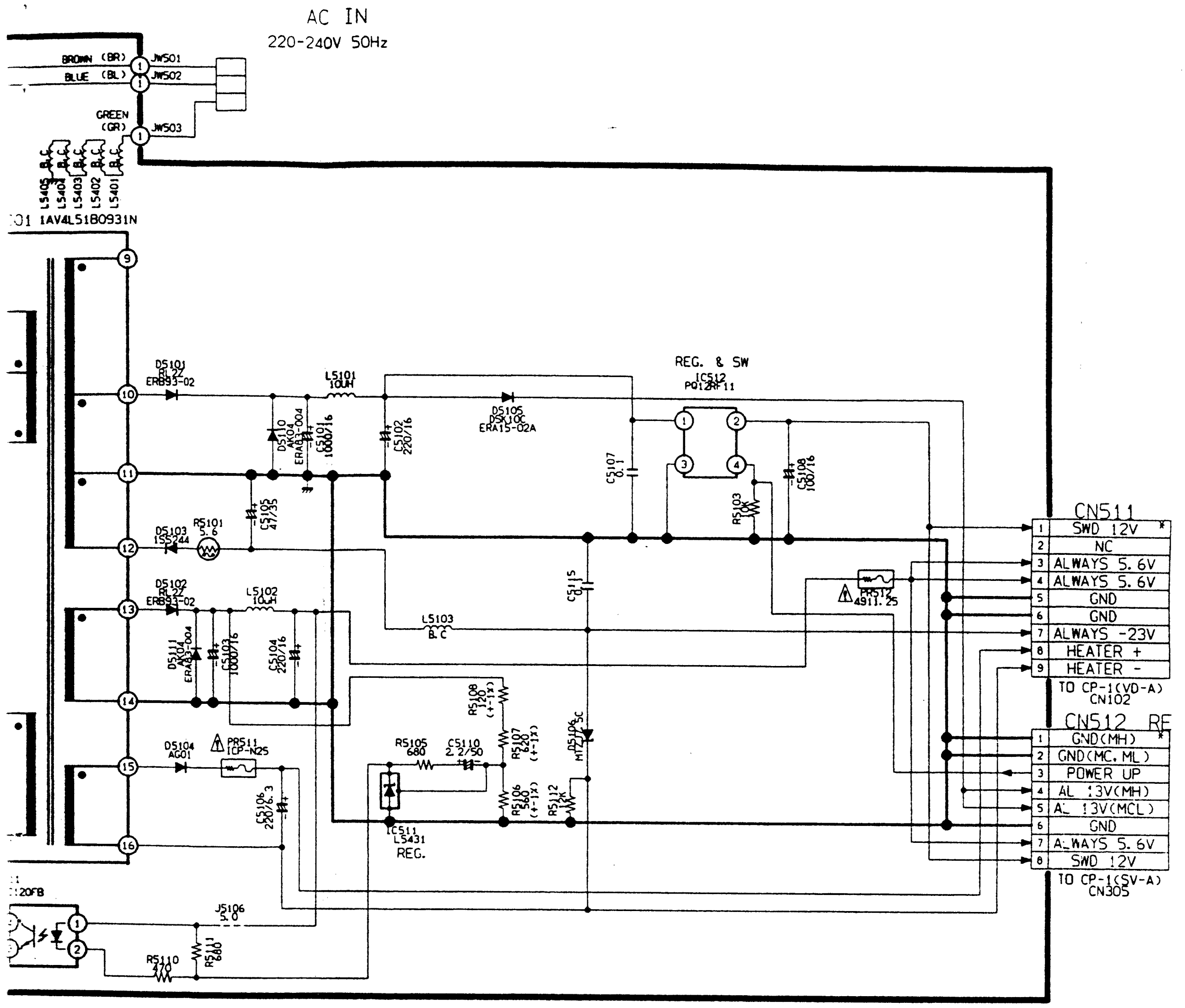

AC IN
220-240V 50Hz
PW-1
P1-80034/FE40-EXSY
L5002 33mH
C5002 0.068/AC250
C5001 0.068/AC250
R5002 2.7M 1/2W
J5001 15
J5002 10
VA501 ENC471D-05A
F5001 T2.5A H 250V
BROWN (BR)
BLUE (BL)
GREEN (GR)
JW501
JW502
JW503
C5004 1000P/AC400
C5005 1000P/AC400
L5405 B.C
L5404 B.C
L5403 B.C
L5402 B.C
L5401 B.C
T5001 1AV4L51B0931N
D5001 DBC10G
C5010 47/400
*)Discharge C5010 before changing Primary Parts
C5011 0.047/250
R5010 68K 2W
C5012 390P/1K
D5002 AP01C
R5022 22K
R5023 22K
R5024 22K
R5025 22K
SW
Q5001
2SK1460
G
D
S
L5003 B.C
R5018 10K
R5011 390K
R5013 270K
R5012 390K
R5014 270K
CONTROL & DRIVE
IC501
TDA4605-3
GND
OUT
LowV
Vcc
ON-T.
SOFT
F.B
ZERO
R5015 12K
C5014 3900P
R5016 3.3K
C5017 4700P
R5017 270
C5016 0.1/50
R5020 10K
C5015 47/35
D5003 1SS244
R5019 4.7
D5011 PC120FB
R5021 1K
C5018 0.1/50
R5110 470
R5111 680
J5106 5.0
D5101 RL2Z ERB93-02
D5103 1SS244
R5101 5.6
D5102 RL2Z ERB93-02
D5104 AG01
PRS11 ICP-N25
D5110 AK04 ERA83-004
C5101 1000/16
L5101 10UH
C5102 220/16
C5105 47/35
D5105 DSK10C ERA15-02A
D5111 AK04 ERA83-004
C5103 1000/16
L5102 10UH
C5104 220/16
C5106 220/6.3
L5103 B.C
REG. & SW
IC512 PQ12RF11
C5107 0.1
C5115 0.1
R5103 10K
R5108 120 (+-1%)
R5107 620 (+-1%)
R5106 560 (+-1%)
R5105 680
C5110 2.2/50
R5112 1K
D5106 MTZJ5.6C
IC511 L5431
REG.

PW-1 P.W.B.


PR511 FUSE PR511 MANUFACTURED BY ROHM TYPE ICP-N25
1AC4B10
JCI-N1S
T5001
CN512
CN511
JW511
JW512
PR512
FUSE PR512 MANUFACTURED BY LITTELFUSE TYPE 4911.25
C5106
R5112
C5113
C5114
R5101
R5102
C5115
J5103
L5103
C5105
L5101
C5101
D5101
D5102
C5102
C5104
C5103
L5102
R5108
R5109
R5107
R5106
R5401
R5402
IC511
R5110
J5101
R5105
R5111
D5011
C5005
C5004
IC512
Q5104
C5108
C5107
J5113
J5112
J5123
R5103
D5105
D5107
J5104
J5114
J5122
R5115
R5114
R5116
R5118
J5117
J5111
J5119
J5118
R5113
C5112
D5103
R5119
R5117
D5104
C5011
C5013
J5013
L5003
D5002
C5012
R5019
R5020
D5003
C5016
C5015
R5031
C5030
D5030
J5011
C5019
R5021
C5018
R5024
R5023
R5025
R5022
C5014
R5016
R5017
C5032
CAUTION
RISK OF FIRE REPL
WITH SAM

6 7 8 9 10 11 12 13

PW-1 BOARD POWER SUPPLY

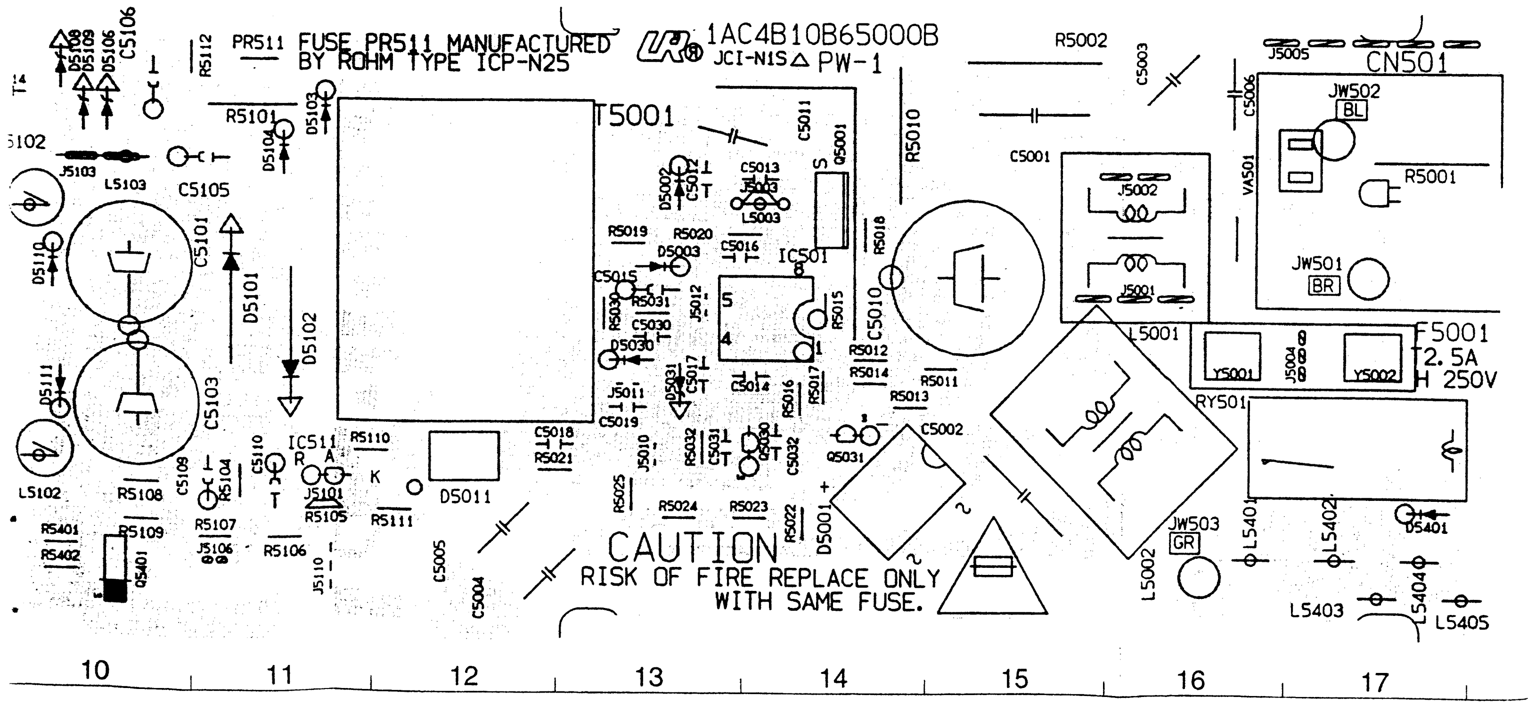


AC IN
220-240V 50Hz
BROWN (BR)
BLUE (BL)
GREEN (GR)
JW501
JW502
JW503
L5405 B.C
L5404 B.C
L5403 B.C
L5402 B.C
L5401 B.C
1AV4L51B0931N
D5101 RL2Z ERB93-02
L5101 10UH
D5110 AR04 ERA83-004
C5101 1000/16
C5102 220/16
D5105 DSK10C ERA15-02A
REG. & SW
IC512 PQ12RF11
C5107 0.1
C5108 100/16
R5103
C5105 47/35
D5103 1SS244
R5101 5.6
C5115 0.1
PR512 4911.25
D5102 RL2Z ERB93-02
L5102 10UH
L5103 B.C
D5111 AR04 ERA83-004
C5103 1000/16
C5104 220/16
R5108 120 (+-1%)
R5107 820 (+-1%)
D5106 MTZJ7.5C
D5104 AG01
PR511 ICP-N25
R5105 680
C5110 2.2/50
C5106 220/6.3
R5106 560 (+-1%)
R5112 2K
IC511 L5431 REG.
J5106 1.0
R5110 470
R5111 680
CN511
1 SWD 12V
2 NC
3 ALWAYS 5.6V
4 ALWAYS 5.6V
5 GND
6 GND
7 ALWAYS -23V
8 HEATER +
9 HEATER -
TO CP-1(VD-A) CN102
CN512 RF
1 GND(MH)
2 GND(MC.ML)
3 POWER UP
4 AL 13V(MH)
5 AL 13V(MCL)
6 GND
7 ALWAYS 5.6V
8 SWD 12V
TO CP-1(SV-A) CN305

(See page 4-14)

(See page 4-16)

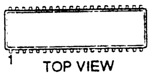
PW-1 P.W.B.



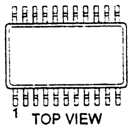
FUSE PR511 MANUFACTURED BY ROHM TYPE ICP-N25
1AC4B10B65000B
JCI-N1S PW-1
T5001
CN501
JW502 BL
JW501 BR
JW503 GR
R5001
R5002
F5001 2.5A H 250V
RY501
Y5001
Y5002
L5001
L5002
J5002
J5001
IC501
Q5001
Q5031
IC511
D5011
CAUTION
RISK OF FIRE REPLACE ONLY WITH SAME FUSE.
L5401
L5402
L5403
L5404
L5405
D5401
Q5401
10
11
12
13
14
15
16
17

4. SEMICONDUCTORS

LA6393D
LA7116
TDA4605-3
TC4030BPHB

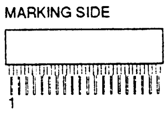


AT24C02-10PC
BA15218
LA7285M-TRM



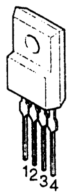
See page 4-14)

LB1643

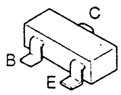

MARKING SIDE
1

See page 4-16)

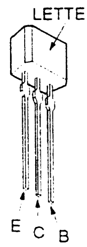
PQ12RF11



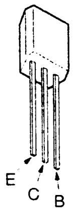
2SA1162-G
2SA1342
2SC2412K-QR
2SC3395
DTA144EK
DTC144EK
DTC343TK



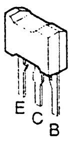
2SC2785-HFE



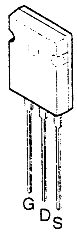
2SC3331-S-AA
2SC2668-Y
DTC114ES
DTC144ES
RN1202



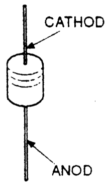
2SC3668-Y



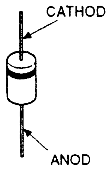
2SK1460LS



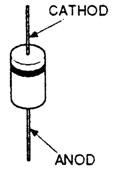
1SS120
AK04-V2
RD15ESB2
RD5.6ESB2
RD7.5ESB2
RD9.1ESB2


CATHOD
ANOD

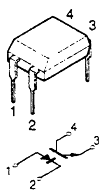
1SS133T-77


CATHOD
ANOD

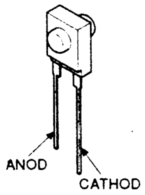
1SS83
EM-1Z
RL2Z-LF-C4


CATHOD
ANOD

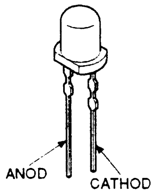
PC120FB



LN59


ANOD
CATHOD

SEL2410G-TP2-D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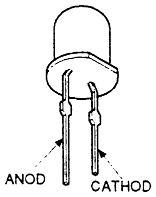
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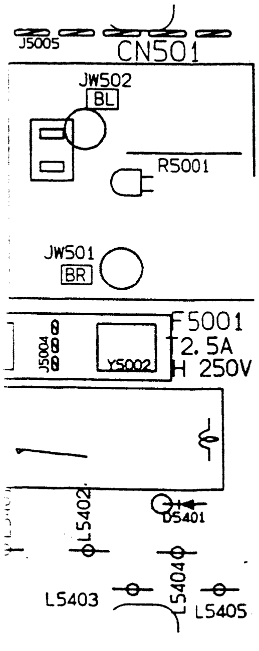
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SECTION 5
EXPLODED VIEWS

NOTE:

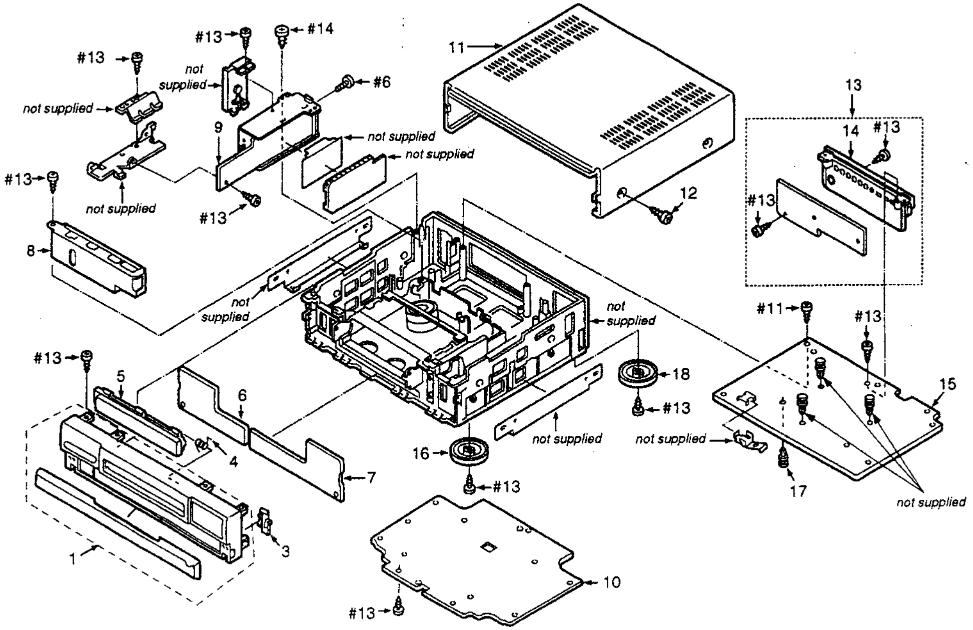
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

Items marked " * " are not stocked because they are seldom required for routine servicing. Some delay should be expected when ordering these items.

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

5-1. CABINET & CHASSIS ASSEMBLY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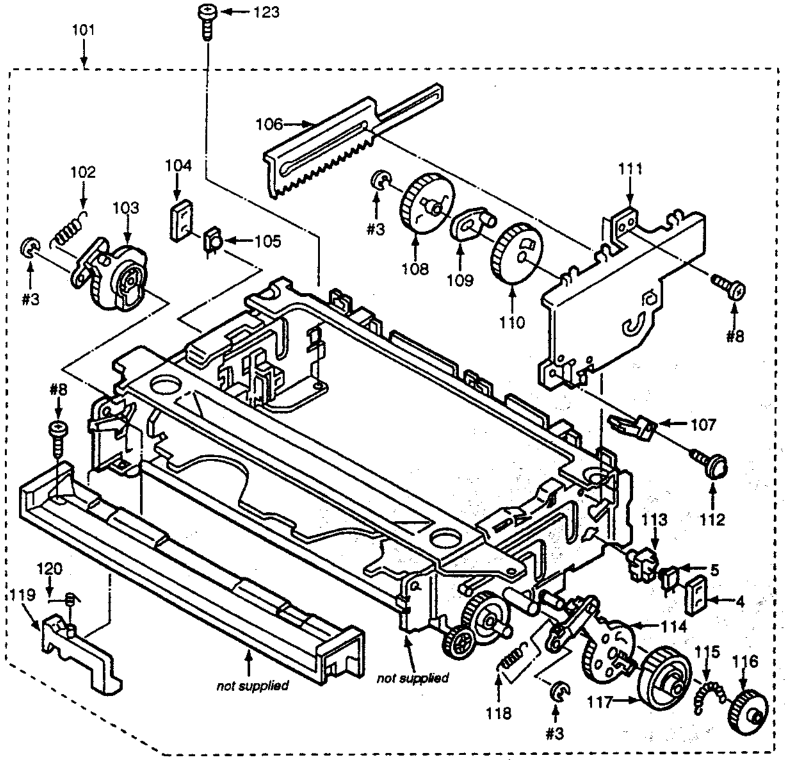
Ref.No	Part No.	Description	Remark
1	A-6780-411-A	CABINET ASSY, FRONT (1000P)	
1	A-6780-408-A	CABINET ASSY, FRONT (5050P)	
3	3-740-330-01	LOCK	
4	3-972-292-01	SPRING	
5	3-972-291-01	DOOR, CASSETTE	
6	*A-6796-467-A	TM-2 BOARD, COMPLETE	
7	*A-6796-474-A	TM-1 BOARD, COMPLETE (1000P)	
7	*A-6796-466-A	TM-1 BOARD, COMPLETE (5050P)	
8	*A-6796-468-A	VP-1 BOARD, COMPLETE	
9	*A-6796-465-A	PW-1 BOARD, COMPLETE	
10	3-946-561-01	COVER, BOTTOM	
11	3-946-564-01	COVER, TOP	
12	3-740-382-01	+BTS-B S 4X12	
13	*A-6796-475-A	TB-1 BOARD, COMPLETE (1000P)	
13	*A-6796-469-A	TB-1 BOARD, COMPLETE (5050P)	
14	*3-969-215-01	BRACKET, TERMINAL	
15	*A-6796-471-A	CP-1 BOARD, COMPLETE (1000P)	
15	*A-6796-459-A	CP-1 BOARD, COMPLETE (5050P)	
16	3-946-553-01	STAND	
17	3-747-603-01	FIXER	
18	*3-961-381-01	STAND (BACK)	

5-2. MECHANISM DECK SECTION-1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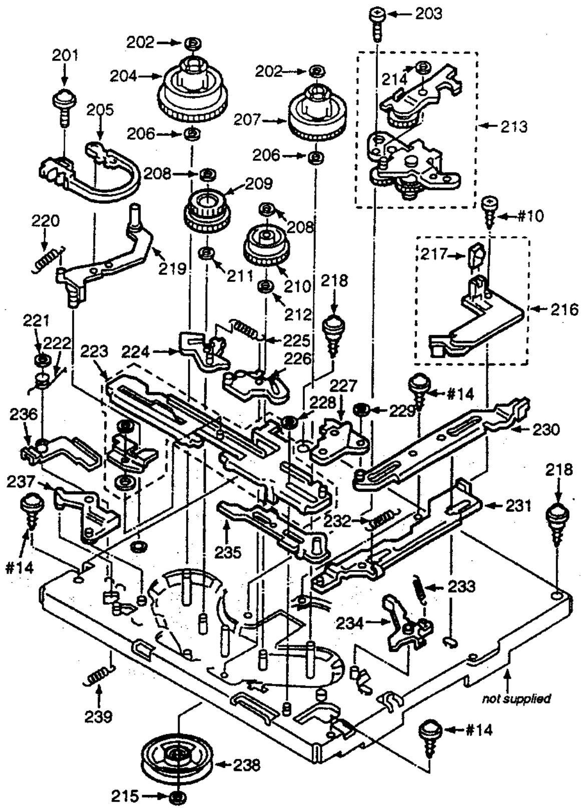
Ref.No	Part No.	Description	Remark
101	A-6773-655-A	MECHANICAL ASSY, CASSETTE	
102	3-735-720-01	SPRING	
103	3-735-719-01	LEVER (L) ASSY, GEAR	
104	3-735-734-01	LID	
105	1-808-710-11	PHOTO TRANSISTO	
106	3-740-344-01	RACK	
107	3-740-345-01	BUTTON, SPECIAL SW	
108	3-957-608-01	GEAR, LOCK	
109	3-735-732-01	LEVER ASSY, PINION	
110	3-735-730-01	GEAR, PINION	
111	3-740-342-01	BRACKET, GEAR	
112	3-735-775-01	SCREW (2X9), +PSW	
113	*3-940-408-01	HOLDER, TRANSISTOR	
114	3-735-723-01	GEAR ASSY, LEVER	
115	3-735-725-01	SPRING	
116	3-735-728-01	GEAR, IDLER	
117	3-735-724-01	GEAR, MAIN	
118	3-735-726-01	SPRING	
119	3-942-686-01	LEVER, SAFETY SWITCH	
120	3-942-688-01	SPRING, SAFETY SWITCH	

5-3. MECHANISM DECK SECTION-2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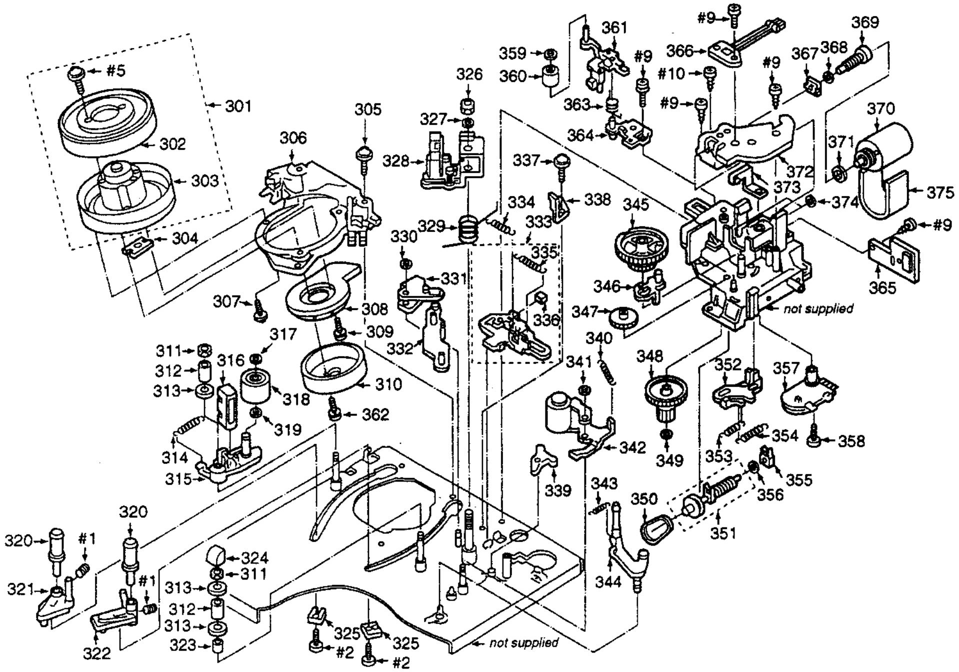
Ref.No	Part No.	Description	Remark
201	3-946-498-01	SCREW (2.6X2.4), SCR PAN +FLG	
202	3-735-755-01	WASHER (DIA.2.6)	
203	3-942-657-01	SCREW (2.6X4), SPECIAL	
204	3-946-510-01	REEL (SUPPLY) (ASSY)	
205	3-946-520-01	HOLDER (ASSY), BAND	
206	3-735-754-01	WASHER (DIA.3), ADJUSTMENT	
207	3-962-568-01	REEL (ASSY), TAKE-UP	
208	3-741-401-01	WASHER Y 2.1X6X0.25	
209	3-946-525-01	GEAR (ASSY), ONE-WAY	
210	3-946-530-01	GEAR, REEL TAKE-UP	
211	3-946-501-01	WASHER (2.6X6X0.13)	
212	3-735-750-01	WASHER (DIA.2.6), SPECIAL	
213	A-6773-660-A	CLUTCH ASSY, IDLER	
214	3-969-213-01	WASHER (Y 2.1X4X0.25)	
215	3-948-603-01	WASHER, SPECIAL	
216	*A-6756-374-A	MC-4 BOARD, COMPLETE	
217	1-808-722-11	DIODE LN59	
218	3-746-714-01	SCREW (3X12), SPECIAL	
219	3-946-528-01	TENSION (ASSY), LEVER	
220	3-946-532-01	SPRING, LEVER TENSION	
221	3-946-499-01	WASHER, SPECIAL	
222	3-946-535-01	SPRING, LEVER BRAKE	
223	A-6773-695-A	PLATE ASSY, M, SLIDE	
224	3-735-656-01	BRAKE ASSY, S	
225	3-735-658-01	SPRING	
226	3-735-657-01	BRAKE ASSY, T	
227	3-735-663-01	LEVER, CONTROL	
228	3-735-761-01	WASHER (DIA.2.6)	
229	3-746-725-01	WASHER, SPECIAL	
230	3-946-523-01	PLATE (ASSY), ACT, SLIDE	
231	3-955-019-01	SLIDE, C BRAKE	
232	3-735-627-01	SPRING	
233	3-735-665-01	SPRING	
234	3-740-349-01	BRAKE	
235	*3-735-628-01	BRAKE, SLIDE ACT	
236	3-946-527-01	BAND (ASSY), LEVER BRAKE	
237	3-735-655-01	BRAKE SUB, S	
238	3-946-531-01	PULLEY, REEL	
239	3-740-348-01	SPRING	

5-4. MECHANISM DECK SECTION-3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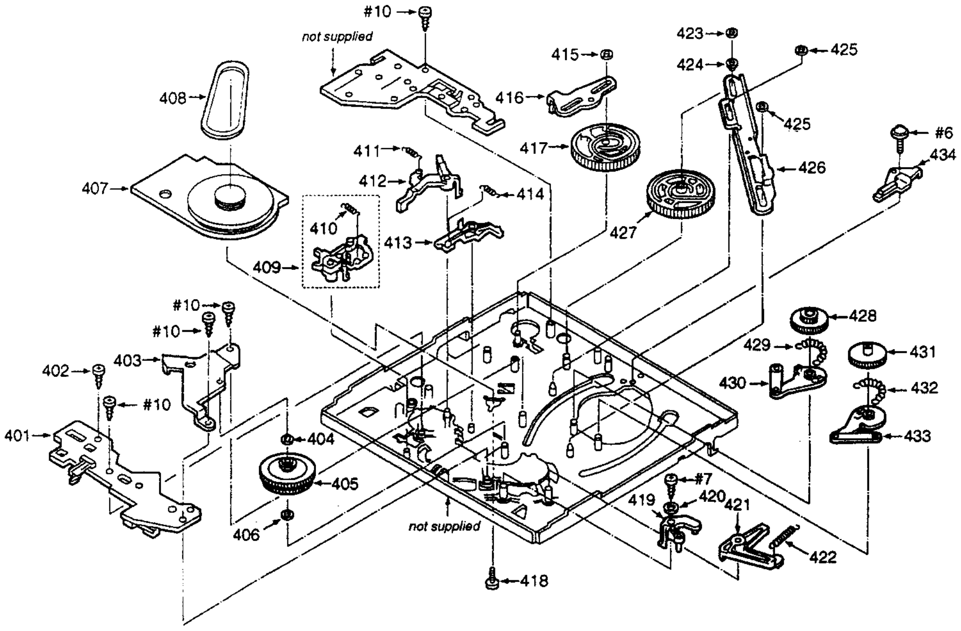
Ref.No	Part No.	Description	Remark
301	A-8311-884-A	CYLINDER COMPLETE PCB	
302	3-191-497-01	CYLINDER (UPR 2N4P-Q)	
303	3-746-722-01	CYLINDER LWR 4	
304	*3-949-898-01	SPACER	
305	3-740-398-01	SCR PAN+FLG 3X6	
306	*3-735-737-01	CYLINDER BASE	
307	3-740-370-01	SCREW (2.6X8), SPECIAL	
308	*1-462-284-11	COIL, MOTOR (STATOR)	
309	3-746-761-01	SCREW (2.3X10), SPECIAL	
310	*1-461-017-11	ROTOR	
311	3-948-510-01	NUT (HEX 3)	
312	3-942-674-01	GUIDE, TAPE	
313	3-741-408-01	WASHER, SPECIAL	
314	3-735-686-01	SPRING	
315	3-948-476-01	LEVER (ASSY), FE HEAD	
316	3-946-507-01	HEAD, FULL ERASE	
317	3-741-407-01	WASHER Y 1.5X4X0.25	
318	3-972-312-01	ROLLER, IMPEDANCE	
319	3-735-771-01	WASHER (DIA.2), SPECIAL	
320	3-735-630-01	ROLLER ASSY, GUIDE	
321	3-946-544-01	ROLLER (S) (BASE) (ASSY)	
322	3-735-632-01	ROLLER (T) ASSY, BASE	
323	3-942-673-01	SLEEVE	
324	3-943-187-01	CAP	
325	3-735-631-01	PLATE, GUIDE	
326	3-735-682-01	NUT (M5), SPECIAL	
327	3-749-106-01	SLEEVE, ACE HEAD	
328	3-961-990-01	BRACKET, COMPL	
329	3-735-680-01	SPRING	
330	3-735-759-01	WASHER (DIA.3)	
331	*3-735-673-01	PINCH LEVER ASSY	
332	3-960-459-01	SLIDE, ACT PINCH	
333	A-6773-659-A	CAM ASSY, SLIDE	
334	3-946-534-01	SPRING, SLIDE BRAKE	
335	3-967-261-01	SPRING, LINK LOCK	
336	3-735-668-01	DAMPER	
337	3-741-410-01	SCR PAN+SE+W 2.6X5	
338	3-942-071-01	STOPPER, BRACKET	
339	3-735-671-01	LEVER, ACT BRAKE	
340	3-735-675-01	SPRING	
341	3-735-757-01	WASHER (DIA.3.6)	
342	3-735-674-01	PINCH ROLLER, COMPL	
343	3-735-660-01	SPRING	
344	3-749-023-01	GUIDE (REV), LEVER ASSY	
345	3-735-703-01	GEAR (F), HELICAL	
346	3-740-366-01	LEVER, FRONT	
347	3-735-704-01	GEAR	
348	3-740-361-01	GEAR, HELICAL	
349	3-740-367-01	WASHER, SLIT	
350	3-735-709-01	BELT (LOADING)	
351	3-740-359-01	LOAD WORM	
352	3-740-362-01	SLIDE, FRONT	
353	3-740-363-01	SPRING	
354	3-740-364-01	SPRING	
355	3-741-413-01	HOLDER WORM	
356	3-735-774-01	WASHER (DIA.2)	
357	1-762-312-11	SHUTTLE, JOG	
358	3-954-387-01	MOTOR (ASSY), HOLDER	
359	3-735-758-01	WASHER (DIA.2.6)	
360	3-960-267-01	ROLLER (ASSY), CLEANER	
361	3-969-214-01	LEVER (ASSY), TL CLEANER	
362	3-746-760-01	SCREW (2.3X6), SPECIAL	
363	3-942-069-01	SPRING	
364	3-954-693-01	BRACKET, CLEANER	
365	*1-589-269-11	MOUNTED BOARD (MC-3)	
366	1-810-708-11	SENSOR, DEW (R-SPECIAL)	
367	3-735-696-01	HOLDER, WORM	
368	3-740-357-01	WASHER	
369	3-735-706-01	WORM ASSY, F	
370	3-942-091-01	MOTOR ASSY, THREADING	
371	3-735-708-01	DAMPER, WORM	
372	3-942-065-01	BRACKET, HOLDER	
373	3-740-354-01	PLATE, NUT	
374	3-740-365-01	DAMPER, MOTOR	
375	3-740-358-01	DAMPER, MOTOR	

5-5. MECHANISM DECK SECTION-4



Ref.No	Part No.	Description	Remark
401	*A-6756-375-A	MC-1 BOARD, COMPLETE	
402	3-740-396-01	SCR STPG BIN 2.6X5	
403	3-946-529-01	PULLEY, BRACKET	
404	3-948-603-01	WASHER, SPECIAL	
405	3-962-569-01	GEAR (ASSY), FRICTION	
406	3-735-760-01	WASHER (DIA.3), SPECIAL	
407	3-946-560-01	CAPSTAN (MOTOR)	
408	3-946-511-01	BELT, REEL DRIVE	
409	3-947-435-01	CLUTCH (ASSY), LEVER	
410	3-735-646-01	SPRING	
411	3-741-405-01	CAPSTAN, SPRING	
412	3-735-649-01	BRAKE ASSY, CAP	
413	3-735-647-01	LEVER, CONVERSION CLUTCH	
414	3-735-648-01	SPRING	
415	3-735-759-01	WASHER (DIA.3), SPECIAL	
416	3-955-018-01	SLIDE, CAM PLATE	
417	3-946-519-01	CAM, MODE	
418	3-740-355-01	SCREW (+P) (2.6X5)	
419	3-740-368-01	CONTROL ASSY, LEVER	
420	3-735-765-01	WASHER (DIA.2.6)	
421	3-946-518-01	LEVER, RETURN TENSION	
422	3-946-533-01	SPRING, REVERSE TENSION	
423	3-735-756-01	WASHER (DIA.3)	
424	3-948-514-01	SPACER, RACK ROAD	
425	3-735-758-01	WASHER (DIA.2.6)	
426	3-948-513-01	ROAD (ASSY), RACK	
427	3-967-861-01	MAIN CAM, TL	
428	3-948-511-01	GEAR, ROAD TAKE-UP	
429	3-735-637-01	SPRING (T)	
430	3-735-636-01	LOAD (T) ASSY, LEVER	
431	3-746-724-01	ROAD (S), GEAR	
432	3-735-634-01	SPRING	
433	3-735-633-01	LOAD (S) ASSY, LEVER	
434	3-735-693-01	PLATE ASSY, GROUND	

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

- Items marked "*" are not stocked because they are seldom required for routine servicing. Some delay should be expected when ordering these items.
- All variable and adjustable resistors have characteristic curve B, unless otherwise stated.

RESISTORS
- All resistors are in ohms.
- F:non-flammable

When indicating part by reference number, please include the board name.

CAPACITORS
- MF: μF, PF: μμF

COILS
- MMH: mH, UH: μH

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

Ref.No	Part No.	Description			Remark
	*A-6796-471-A	CP-1 BOARD, COMPLETE (1000P)			
	*A-6796-459-A	CP-1 BOARD, COMPLETE (5050P)			
		********************			
	3-747-604-01	SPRING PLATE			
	*3-967-911-01	BRACKET, TERMINAL			
	*3-972-441-01	INDICATOR, DEC			
	7-685-548-19	SCREW +BTP 3X12 TYPE2 N-S			
A7101	1-519-675-11	INDICATOR TUBE, FLUORESCENT			
		<BUZZER>			
BZ730	1-529-113-11	BUZZER, PIEZO CB13PA-X5			
		<CAPACITOR>			
C1001	1-162-201-31	CERAMIC	12PF	5%	50V
C1002	1-162-201-31	CERAMIC	12PF	5%	50V
C1003	1-162-207-31	CERAMIC	22PF	5%	50V
C1004	1-162-207-31	CERAMIC	22PF	5%	50V
C1005	1-164-073-11	CERAMIC	100PF	10%	50V
C1006	1-164-073-11	CERAMIC	100PF	10%	50V
C1007	1-164-073-11	CERAMIC	100PF	10%	50V
C1008	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1009	1-126-154-11	ELECT	47MF	20%	6.3V
C1011	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1014	1-164-073-11	CERAMIC	100PF	10%	50V
C1018	1-126-301-11	ELECT	1MF	20%	50V
C1021	1-124-259-11	ELECT	4.7MF	20%	50V
C1022	1-124-257-00	ELECT	2.2MF	20%	50V
C1023	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1061	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C1063	1-126-916-11	ELECT	1000MF	20%	6.3V
C1064	1-111-241-11	ELECT	10MF	20%	16V
C1065	1-102-937-00	CERAMIC	4PF		50V
C1066	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C1102	1-162-201-31	CERAMIC	12PF	5%	50V
C1103	1-162-209-31	CERAMIC	27PF	5%	50V
C1104	1-164-077-11	CERAMIC	220PF	10%	50V
C1105	1-162-211-31	CERAMIC	33PF	5%	50V
C1106	1-124-465-00	ELECT	0.47MF	20%	50V
C1107	1-162-195-31	CERAMIC	4.7PF	10%	50V
C1108	1-164-080-11	CERAMIC	390PF	10%	50V
C1110	1-162-195-31	CERAMIC	4.7PF	10%	50V
C1111	1-162-280-31	CERAMIC	82PF	10%	50V
C1112	1-111-241-11	ELECT	10MF	20%	16V
C1113	1-111-241-11	ELECT	10MF	20%	16V
C1114	1-124-465-00	ELECT	0.47MF	20%	50V
C1116	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1118	1-162-287-31	CERAMIC	270PF	10%	50V
C1119	1-126-301-11	ELECT	1MF	20%	50V
C1120	1-126-301-11	ELECT	1MF	20%	50V
C1121	1-161-059-00	CERAMIC	0.047MF	10%	50V
C1122	1-161-055-00	CERAMIC	0.022MF	10%	50V
C1123	1-101-890-00	CERAMIC	75PF	5%	50V
C1125	1-126-301-11	ELECT	1MF	20%	50V
C1126	1-126-301-11	ELECT	1MF	20%	50V
C1127	1-161-059-00	CERAMIC	0.047MF	10%	50V
C1128	1-161-055-00	CERAMIC	0.022MF	10%	50V
C1129	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1130	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1131	1-111-241-11	ELECT	10MF	20%	16V
C1132	1-126-154-11	ELECT	47MF	20%	6.3V
C1133	1-161-063-00	CERAMIC	0.1MF	10%	50V
C1134	1-111-241-11	ELECT	10MF	20%	16V
C1135	1-111-241-11	ELECT	10MF	20%	16V
C1136	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1138	1-162-203-31	CERAMIC	15PF	5%	50V
C1140	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1141	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C1154	1-161-056-00	CERAMIC	0.027MF	10%	25V
C1157	1-102-947-00	CERAMIC	10PF	5%	50V
C1201	1-162-215-31	CERAMIC	47PF	5%	50V
C1202	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1204	1-162-211-31	CERAMIC	33PF	5%	50V
C1206	1-162-211-31	CERAMIC	33PF	5%	50V
C1208	1-162-209-31	CERAMIC	27PF	5%	50V
C1209	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1212	1-162-203-31	CERAMIC	15PF	5%	50V
C1213	1-126-155-11	ELECT	100MF	20%	6.3V
C1214	1-162-203-31	CERAMIC	15PF	5%	50V
C1216	1-162-209-31	CERAMIC	27PF	5%	50V
C1217	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1218	1-126-154-11	ELECT	47MF	20%	6.3V
C1219	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1220	1-162-195-31	CERAMIC	4.7PF	10%	50V
C1221	1-162-215-31	CERAMIC	47PF	5%	50V
C1222	1-162-215-31	CERAMIC	47PF	5%	50V
C1223	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1224	1-126-301-11	ELECT	1MF	20%	50V
C1225	1-161-055-00	CERAMIC	0.022MF	10%	50V
C1226	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1227	1-111-241-11	ELECT	10MF	20%	16V
C1232	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1234	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1251	1-162-207-31	CERAMIC	22PF	5%	50V
C1252	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1253	1-162-211-31	CERAMIC	33PF	5%	50V
C1262	1-102-129-00	CERAMIC	0.01MF	10%	50V
C1263	1-164-076-11	CERAMIC	180PF	10%	50V
C1264	1-102-129-00	CERAMIC	0.01MF	10%	50V

Ref.No	Part No.	Description	Remark
C1265	1-102-129-00	CERAMIC 0.01MF 10%	50V
C1266	1-102-129-00	CERAMIC 0.01MF 10%	50V
C1268	1-162-219-31	CERAMIC 68PF 5%	50V
C1269	1-164-080-11	CERAMIC 390PF 10%	50V
C1270	1-161-059-00	CERAMIC 0.047MF 10%	50V
C1272	1-102-129-00	CERAMIC 0.01MF 10%	50V
C1401	1-126-154-11	ELECT 47MF 20%	6.3V
C1402	1-102-129-00	CERAMIC 0.01MF 10%	50V
C1403	1-162-207-31	CERAMIC 22PF 5%	50V
C1404	1-164-073-11	CERAMIC 100PF 10%	50V
C1406	1-162-294-31	CERAMIC 0.001MF 10%	50V
C1407	1-124-259-11	ELECT 4.7MF 20%	50V
C1409	1-111-241-11	ELECT 10MF 20%	16V
C1410	1-164-087-11	CERAMIC 0.0015MF 10%	50V
C1416	1-162-201-31	CERAMIC 12PF 5%	50V
C1417	1-162-215-31	CERAMIC 47PF 5%	50V
C1418	1-164-064-11	CERAMIC 56PF 5%	50V
C1420	1-102-129-00	CERAMIC 0.01MF 10%	50V
C1421	1-164-004-11	CERAMIC CHIP 0.1MF 10%	25V
C1602	1-164-004-11	CERAMIC CHIP 0.1MF 10%	25V
C2003	1-124-257-00	ELECT 2.2MF 20%	50V
C2004	1-111-241-11	ELECT 10MF 20%	16V
C2005	1-161-379-00	CERAMIC 0.01MF 20%	25V
C2006	1-162-207-31	CERAMIC 22PF 5%	50V
C2009	1-124-234-00	ELECT 22MF 20%	16V
C2010	1-124-589-11	ELECT 47MF 20%	16V
C2013	1-163-023-00	CERAMIC CHIP 0.015MF 10%	50V
C2016	1-124-259-11	ELECT 4.7MF 20%	50V
C2017	1-111-241-11	ELECT 10MF 20%	16V
C2019	1-124-589-11	ELECT 47MF 20%	16V
C2020	1-162-286-31	CERAMIC 220PF 10%	50V
C2021	1-110-363-11	POLYP 6500P	100V
C2022	1-102-129-00	CERAMIC 0.01MF 10%	50V
C2024	1-102-129-00	CERAMIC 0.01MF 10%	50V
C2030	1-111-241-11	ELECT 10MF 20%	16V
C2031	1-124-464-11	ELECT 0.22MF 20%	50V
C2033	1-161-494-11	CERAMIC 0.022MF 30%	25V
C2051	1-164-086-11	CERAMIC 0.0012MF 20%	50V
C2071	1-161-024-00	CERAMIC 0.082MF 10%	25V
C2072	1-124-229-00	ELECT 33MF 20%	6.3V
C2073	1-124-465-00	ELECT 0.47MF 20%	50V
C2091	1-161-063-00	CERAMIC 0.1MF 10%	50V
C2092	1-161-327-00	CERAMIC 0.0033MF 30%	50V
C2101	1-161-063-00	CERAMIC 0.1MF 10%	50V
C3001	1-162-201-31	CERAMIC 12PF 5%	50V
C3002	1-162-207-31	CERAMIC 22PF 5%	50V
C3003	1-162-207-31	CERAMIC 22PF 5%	50V
C3004	1-162-207-31	CERAMIC 22PF 5%	50V
C3005	1-126-154-11	ELECT 47MF 20%	6.3V
C3006	1-102-129-00	CERAMIC 0.01MF 10%	50V
C3007	1-162-286-31	CERAMIC 220PF 10%	50V
C3008	1-102-129-00	CERAMIC 0.01MF 10%	50V
C3009	1-102-129-00	CERAMIC 0.01MF 10%	50V
C3011	1-163-009-11	CERAMIC CHIP 0.001MF 10%	50V
C3012	1-126-154-11	ELECT 47MF 20%	6.3V
C3013	1-164-081-11	CERAMIC 470PF 10%	50V
C3014	1-126-155-11	ELECT 100MF 20%	6.3V
C3015	1-126-176-11	ELECT 220MF 20%	10V
C3016	1-164-004-11	CERAMIC CHIP 0.1MF 10%	25V
C3018	1-102-129-00	CERAMIC 0.01MF 10%	50V
C3020	1-126-301-11	ELECT 1MF 20%	50V
C3021	1-126-529-11	ELECT 0.47MF 20%	50V
C3022	1-109-889-11	ELECT 1MF 20%	50V
C3024	1-102-129-00	CERAMIC 0.01MF 10%	50V
C3025	1-102-129-00	CERAMIC 0.01MF 10% 50V	

Ref.No	Part No.	Description	Remark
C3026	1-102-129-00	CERAMIC 0.01MF 10% 50V	
C3028	1-102-129-00	CERAMIC 0.01MF 10% 50V	
C3029	1-161-061-11	CERAMIC 0.068MF 10% 25V	
C3031	1-161-061-11	CERAMIC 0.068MF 10% 25V	
C3032	1-162-211-31	CERAMIC 33PF 5% 50V	
C3033	1-162-211-31	CERAMIC 33PF 5% 50V	
C3034	1-162-211-31	CERAMIC 33PF 5% 50V	
C3035	1-164-064-11	CERAMIC 56PF 5% 50V	
C3036	1-164-064-11	CERAMIC 56PF 5% 50V	
C3037	1-164-064-11	CERAMIC 56PF 5% 50V	
C3038	1-126-916-11	ELECT 1000MF 20% 6.3V	
C3039	1-124-234-00	ELECT 22MF 20% 16V	
C3040	1-126-176-11	ELECT 220MF 20% 10V	
C3041	1-124-234-00	ELECT 22MF 20% 16V	
C3042	1-126-154-11	ELECT 47MF 20% 6.3V	
C3043	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C3044	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C3045	1-111-241-11	ELECT 10MF 20% 16V	
C3049	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C3050	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C3054	1-102-129-00	CERAMIC 0.01MF 10% 50V	
C3055	1-126-154-11	ELECT 47MF 20% 6.3V	
C3056	1-124-465-00	ELECT 0.47MF 20% 50V	
C3057	1-163-017-00	CERAMIC CHIP 0.0047MF 10% 50V	
C3058	1-126-301-11	ELECT 1MF 20% 50V	
C3059	1-163-017-00	CERAMIC CHIP 0.0047MF 10% 50V	
C3060	1-126-301-11	ELECT 1MF 20% 50V	
C3061	1-126-154-11	ELECT 47MF 20% 6.3V	
C3062	1-164-073-11	CERAMIC 100PF 10% 50V	
C3063	1-164-073-11	CERAMIC 100PF 10% 50V	
C3064	1-124-234-00	ELECT 22MF 20% 16V	
C3065	1-124-234-00	ELECT 22MF 20% 16V	
C3066	1-126-176-11	ELECT 220MF 20% 10V	
C3067	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C3069	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C3070	1-111-241-11	ELECT 10MF 20% 16V	
C3072	1-162-286-31	CERAMIC 220PF 10% 50V	
C3073	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C3074	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C3079	1-102-129-00	CERAMIC 0.01MF 10% 50V	
C3080	1-102-129-00	CERAMIC 0.01MF 10% 50V	
C3081	1-102-129-00	CERAMIC 0.01MF 10% 50V	
C3091	1-164-077-11	CERAMIC 220PF 10% 50V	
C3092	1-162-201-31	CERAMIC 12PF 5% 50V	
C3101	1-161-063-00	CERAMIC 0.1MF 10% 50V	
C3102	1-124-257-00	ELECT 2.2MF 20% 50V	
C3503	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C7301	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C7302	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C7307	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V(5050P)	
C7308	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V(5050P)	
C7309	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V(5050P)	
C7310	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C7311	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V(5050P)	
C7312	1-164-077-11	CERAMIC 220PF 10% 50V	
C7313	1-164-077-11	CERAMIC 220PF 10% 50V	
C7314	1-164-077-11	CERAMIC 220PF 10% 50V	
		<CONNECTOR>	
CN712	1-778-520-11	PLUG, BOARD(16P)	
		<DIODE>	
D1001	8-719-991-33	DIODE 1SS133T-77	
D1101	8-719-991-33	DIODE 1SS133T-77	

Ref.No	Part No.	Description	Remark
D1104	8-719-991-33	DIODE 1SS133T-77	
D1105	8-719-991-33	DIODE 1SS133T-77	
D1152	8-719-991-33	DIODE 1SS133T-77	
D1601	8-719-109-89	DIODE RD5.6ESB2	
D2051	8-719-912-20	DIODE 1SS120	
D2052	8-719-912-20	DIODE 1SS120	
D2055	8-719-912-20	DIODE 1SS120	
D2056	8-719-912-20	DIODE 1SS120	
D3001	8-719-991-33	DIODE 1SS133T-77	
D3004	8-719-901-83	DIODE 1SS83	
D3005	8-719-991-33	DIODE 1SS133T-77	
D3006	8-719-901-83	DIODE 1SS83	
D3008	8-719-109-89	DIODE RD5.6ESB2	
D3009	8-719-109-89	DIODE RD5.6ESB2	
D3010	8-719-991-33	DIODE 1SS133T-77	
D3011	8-719-991-33	DIODE 1SS133T-77	
D3012	8-719-991-33	DIODE 1SS133T-77	
D3013	8-719-991-33	DIODE 1SS133T-77	
D3014	8-719-110-13	DIODE RD9.1ESB2	
D3015	8-719-109-89	DIODE RD5.6ESB2	
D3016	8-719-991-33	DIODE 1SS133T-77	
D3017	1-809-070-11	DIODE AK04-V2	
D3091	8-719-991-33	DIODE 1SS133T-77	
D7301	8-719-991-33	DIODE 1SS133T-77	
D7302	8-719-991-33	DIODE 1SS133T-77	
D7303	8-719-991-33	DIODE 1SS133T-77	
D7307	8-719-991-33	DIODE 1SS133T-77	
		<DELAY LINE>	
DL121	1-415-899-11	DELAY, 2H	
		<IC>	
IC101	1-801-220-11	IC LC74781-9013	
IC111	1-809-674-11	IC LA7395	
IC121	1-810-193-11	IC LC89925	
IC122	1-809-584-11	IC LA6393D	
IC141	8-752-031-49	IC CXA1203M	
IC201	1-810-497-11	IC LA7285M-TRM	
IC301	1-801-565-11	IC uPD784915GF-112-3BA (1000P)	
IC301	1-801-566-11	IC uPD78P4916GF-10-3BA (5050P)	
IC302	1-810-787-11	IC MN1381-H	
IC303	8-759-353-59	IC LB1643	
IC304	1-808-716-11	IC LA7116	
IC305	8-759-251-04	IC AT24C02-10PC	
IC306	1-801-356-11	IC MN1381-R	
IC308	8-759-207-73	IC TC4030BPHB	
		<INDUCTOR>	
L1001	1-410-514-11	INDUCTOR 27UH	
L1101	1-410-521-11	INDUCTOR 100UH	
L1103	1-410-322-11	INDUCTOR 3.3UH	
L1105	1-410-501-11	INDUCTOR 2.2UH	
L1201	1-410-512-11	INDUCTOR 18UH	
L1202	1-410-516-11	INDUCTOR 39UH	
L1203	1-410-516-11	INDUCTOR 39UH	
L1204	1-410-516-11	INDUCTOR 39UH	
L1205	1-410-516-11	INDUCTOR 39UH	
L1206	1-410-518-41	INDUCTOR 56UH	
L1209	1-410-520-11	INDUCTOR 82UH	
L1253	1-410-515-11	INDUCTOR 33UH	
L1254	1-410-511-11	INDUCTOR 15UH	
L1261	1-410-515-11	INDUCTOR 33UH	
L1263	1-410-525-11	INDUCTOR 220UH	

Ref.No	Part No.	Description	Remark
L1264	1-410-335-11	INDUCTOR 150UH	
L1402	1-410-509-11	INDUCTOR 10UH	
L2001	1-500-128-11	CORE, FERRITE	
L2002	1-410-087-31	INDUCTOR 10mH	
L2003	1-410-491-11	INDUCTOR 560UH	
L7301	1-414-142-11	INDUCTOR 1UH	
L7302	1-414-142-11	INDUCTOR 1UH (5050P)	
		<TRANSISTOR>	
Q1003	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1004	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1005	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1051	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1052	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1053	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1054	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1055	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1101	8-729-901-01	TRANSISTOR DTC144EK	
Q1102	8-729-901-01	TRANSISTOR DTC144EK	
Q1103	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1105	8-729-901-01	TRANSISTOR DTC144EK	
Q1151	8-729-901-01	TRANSISTOR DTC144EK	
Q1152	8-729-901-01	TRANSISTOR DTC144EK	
Q1201	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1202	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1203	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1204	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1205	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1206	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1207	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1208	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1209	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1210	8-729-901-01	TRANSISTOR DTC144EK	
Q1211	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1212	8-729-901-06	TRANSISTOR DTC144EK	
Q1261	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1262	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1263	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1264	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1401	8-729-901-01	TRANSISTOR DTC144EK	
Q1404	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1405	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q1602	8-729-205-97	TRANSISTOR 2SC3668-Y	
Q1603	8-729-216-22	TRANSISTOR 2SA1162-G	
Q1604	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q2001	1-810-471-11	TRANSISTOR 2SC3331-S-AA	
Q2002	8-729-805-45	TRANSISTOR 2SC3395	
Q2003	8-729-805-67	TRANSISTOR 2SA1342	
Q2004	8-729-805-45	TRANSISTOR 2SC3395	
Q2010	8-729-805-45	TRANSISTOR 2SC3395	
Q2011	8-729-805-45	TRANSISTOR 2SC3395	
Q2012	8-729-805-45	TRANSISTOR 2SC3395	
Q2031	8-729-805-45	TRANSISTOR 2SC3395	
Q2051	8-729-920-31	TRANSISTOR DTC343TK	
Q2052	8-729-920-31	TRANSISTOR DTC343TK	
Q3001	8-729-205-97	TRANSISTOR 2SC3668-Y	
Q3002	8-729-205-97	TRANSISTOR 2SC3668-Y	
Q3003	8-729-205-97	TRANSISTOR 2SC3668-Y	
Q3004	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q3005	8-729-205-97	TRANSISTOR 2SC3668-Y	
Q3006	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q3091	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q7301	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q7302	8-729-920-74	TRANSISTOR 2SC2412K-QR	

Ref.No	Part No.	Description	Remark
Q7303	8-729-920-74	TRANSISTOR 2SC2412K-QR	(5050P)
Q7304	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q7305	8-729-216-22	TRANSISTOR 2SA1162-G	
Q7308	8-729-920-74	TRANSISTOR 2SC2412K-QR	
Q7309	8-729-920-74	TRANSISTOR 2SC2412K-QR	(5050P)
Q7310	8-729-216-22	TRANSISTOR 2SA1162-G	(5050P)
Q7311	8-729-216-22	TRANSISTOR 2SA1162-G	(5050P)
Q7312	8-729-216-22	TRANSISTOR 2SA1162-G	(5050P)
Q7313	8-729-216-22	TRANSISTOR 2SA1162-G	
Q7314	8-729-901-01	TRANSISTOR DTC144EK	
Q7316	8-729-901-01	TRANSISTOR DTC144EK	
Q7318	8-729-900-80	TRANSISTOR DTC144EK	
Q7320	8-729-216-22	TRANSISTOR 2SA1162-G	(5050P)
Q7321	8-729-920-74	TRANSISTOR 2SC2412K-QR	(5050P)
		<RESISTOR>	
R1012	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R1013	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R1014	1-216-115-00	METAL GLAZE 560K 5% 1/10W	
R1015	1-216-029-00	METAL GLAZE 150 5% 1/10W	
R1016	1-216-029-00	METAL GLAZE 150 5% 1/10W	
R1017	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R1066	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R1067	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1068	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1069	1-216-022-00	METAL GLAZE 75 5% 1/10W	
R1070	1-216-093-11	METAL GLAZE 68K 5% 1/10W	
R1071	1-216-091-00	METAL GLAZE 56K 5% 1/10W	
R1072	1-216-045-00	METAL GLAZE 680 5% 1/10W	
R1073	1-216-071-00	METAL GLAZE 8.2K 5% 1/10W	
R1074	1-216-071-00	METAL GLAZE 8.2K 5% 1/10W	
R1075	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R1076	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R1077	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R1078	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1101	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R1102	1-216-055-00	METAL GLAZE 1.8K 5% 1/10W	
R1103	1-216-049-00	METAL GLAZE 1K 5% 1/10W	
R1104	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	
R1105	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R1106	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	
R1107	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R1108	1-216-045-00	METAL GLAZE 680 5% 1/10W	
R1110	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	
R1111	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R1114	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R1115	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R1116	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R1117	1-216-071-00	METAL GLAZE 8.2K 5% 1/10W	
R1118	1-216-055-00	METAL GLAZE 1.8K 5% 1/10W	
R1119	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1120	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1121	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R1123	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R1124	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1125	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R1126	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1127	1-216-021-00	METAL GLAZE 68 5% 1/10W	
R1128	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R1129	1-216-055-00	METAL GLAZE 1.8K 5% 1/10W	
R1130	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R1131	1-216-677-11	METAL GLAZE 12K 1% 1/10W	
R1132	1-216-071-00	METAL GLAZE 8.2K 5% 1/10W	
R1133	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1134	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R1151	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R1153	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R1154	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R1155	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R1156	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1201	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1202	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R1203	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R1204	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R1205	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1206	1-216-035-00	METAL GLAZE 270 5% 1/10W	
R1207	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1208	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R1209	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1210	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1211	1-216-047-00	METAL GLAZE 820 5% 1/10W	
R1212	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1213	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R1214	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1215	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R1216	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R1217	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R1218	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1219	1-216-043-00	METAL GLAZE 560 5% 1/10W	
R1220	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1221	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1222	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R1224	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R1225	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R1226	1-216-109-00	METAL GLAZE 330K 5% 1/10W	
R1229	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1230	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R1231	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R1251	1-216-041-11	METAL GLAZE 470 5% 1/10W	
R1254	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R1263	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R1264	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R1265	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R1266	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1267	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1268	1-216-035-00	METAL GLAZE 270 5% 1/10W	
R1269	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R1402	1-216-041-11	METAL GLAZE 470 5% 1/10W	
R1403	1-216-043-00	METAL GLAZE 560 5% 1/10W	
R1404	1-216-043-00	METAL GLAZE 560 5% 1/10W	
R1407	1-216-071-00	METAL GLAZE 8.2K 5% 1/10W	
R1408	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R1409	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R1411	1-216-109-00	METAL GLAZE 330K 5% 1/10W	
R1413	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R1418	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R1419	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R1421	1-216-037-00	METAL GLAZE 330 5% 1/10W	
R1422	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	
R1423	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R1424	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R1425	1-216-035-00	METAL GLAZE 270 5% 1/10W	
R1427	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R1428	1-216-101-00	METAL GLAZE 150K 5% 1/10W	
R1602	1-216-045-00	METAL GLAZE 680 5% 1/10W	
R1603	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1604	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R1605	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R1606	1-216-089-00	METAL GLAZE 47K 5% 1/10W	

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

Ref.No	Part No.	Description	Remark
R2001	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R2002	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R2003	1-216-028-00	METAL GLAZE 130 5% 1/10W	
R2004	1-216-109-00	METAL GLAZE 330K 5% 1/10W	
R2005	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R2009	1-216-121-00	METAL GLAZE 1M 5% 1/10W	
R2010	1-208-810-11	METAL GLAZE 15K 1% 1/10W	
R2011	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R2012	1-208-810-11	METAL GLAZE 15K 1% 1/10W	
R2013	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R2014	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R2018	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R2021	1-216-013-00	METAL GLAZE 33 5% 1/10W	
R2022	1-216-017-00	METAL GLAZE 47 5% 1/10W	
R2023	1-208-810-11	METAL GLAZE 15K 1% 1/10W	
R2024	1-216-311-00	METAL GLAZE 6.8 5% 1/10W	
R2035	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R2037	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R2038	1-216-063-00	METAL GLAZE 3.9K 5% 1/10W	
R2042	1-216-097-00	METAL GLAZE 100K 5% 1/10W	
R2050	1-216-021-00	METAL GLAZE 68 5% 1/10W	
R2051	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R2071	1-216-019-00	METAL GLAZE 56 5% 1/10W	
R2091	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R2094	1-216-071-00	METAL GLAZE 8.2K 5% 1/10W	
R2095	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R2101	1-216-091-00	METAL GLAZE 56K 5% 1/10W	
R2102	1-208-810-11	METAL GLAZE 15K 1% 1/10W	
R2105	1-216-043-00	METAL GLAZE 560 5% 1/10W	
R2106	1-216-043-00	METAL GLAZE 560 5% 1/10W	
R3001	1-216-109-00	METAL GLAZE 330K 5% 1/10W	
R3002	1-216-119-00	METAL GLAZE 820K 5% 1/10W	
R3003	1-216-083-00	METAL GLAZE 27K 5% 1/10W	
R3004	1-216-107-00	METAL GLAZE 270K 5% 1/10W	
R3005	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R3006	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R3007	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R3008	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R3009	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R3010	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R3011	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3012	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3013	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3014	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3015	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3016	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3017	1-216-104-00	METAL GLAZE 200K 5% 1/10W	
R3018	1-216-104-00	METAL GLAZE 200K 5% 1/10W	
R3019	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R3020	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3021	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3022	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3023	1-216-045-00	METAL GLAZE 680 5% 1/10W	
R3024	1-216-045-00	METAL GLAZE 680 5% 1/10W	
R3028	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R3029	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R3031	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R3033	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R3034	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R3036	1-216-085-00	METAL GLAZE 33K 5% 1/10W	
R3037	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R3038	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3039	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3040	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3041	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3042	1-216-043-00	METAL GLAZE 560 5% 1/10W	
R3043	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R3044	1-249-415-11	CARBON 680 5% 1/4W	
R3045	1-249-413-11	CARBON 470 5% 1/4W	
R3046	1-216-109-00	METAL GLAZE 330K 5% 1/10W	
R3048	1-249-412-11	CARBON 390 5% 1/4W	
R3049	1-249-403-11	CARBON 68 5% 1/4W	
R3050	1-249-403-11	CARBON 68 5% 1/4W	
R3053	1-216-055-00	METAL GLAZE 1.8K 5% 1/10W	
R3055	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3056	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3057	1-216-067-00	METAL GLAZE 5.6K 5% 1/10W	
R3058	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R3059	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R3060	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3061	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R3062	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R3063	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3064	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3065	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R3066	1-216-105-00	METAL GLAZE 220K 5% 1/10W	
R3067	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R3068	1-216-105-00	METAL GLAZE 220K 5% 1/10W	
R3069	1-249-413-11	CARBON 470 5% 1/4W	
R3070	1-249-413-11	CARBON 470 5% 1/4W	
R3071	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3072	1-216-041-11	METAL GLAZE 470 5% 1/10W	
R3073	1-216-109-00	METAL GLAZE 330K 5% 1/10W	
R3074	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R3075	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3077	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R3078	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R3079	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R3080	1-216-053-00	METAL GLAZE 1.5K 5% 1/10W	
R3081	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R3082	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3083	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R3084	1-216-061-00	METAL GLAZE 3.3K 5% 1/10W	
R3085	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R3087	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R3088	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R3089	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3090	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R3091	1-216-089-00	METAL GLAZE 47K 5% 1/10W	
R3092	1-216-081-00	METAL GLAZE 22K 5% 1/10W	
R3093	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R3094	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R3095	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R3096	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R3097	1-216-064-00	METAL GLAZE 4.3K 5% 1/10W	
R3098	1-216-064-00	METAL GLAZE 4.3K 5% 1/10W	
R3099	1-216-064-00	METAL GLAZE 4.3K 5% 1/10W	
R3101	1-216-057-00	METAL GLAZE 2.2K 5% 1/10W	
R3102	1-216-051-00	METAL GLAZE 1.2K 5% 1/10W	
R3103	1-216-059-00	METAL GLAZE 2.7K 5% 1/10W	
R3104	⚠1-212-946-11	FUSIBLE 3.3 5% 1/2W	
R3105	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R3106	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R7301	1-216-073-00	METAL GLAZE 10K 5% 1/10W	(5050P)
R7303	1-216-073-00	METAL GLAZE 10K 5% 1/10W	
R7305	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
R7306	1-216-065-00	METAL GLAZE 4.7K 5% 1/10W	
R7307	1-216-073-00	METAL GLAZE 10K 5% 1/10W	

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Ne les remplacer que par une piece portant le numero specifie.

Ref.No	Part No.	Description			Remark
R7310	1-216-073-00	METAL GLAZE	10K	5%	1/10W(5050P)
R7312	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R7313	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R7314	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R7315	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R7316	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R7318	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R7320	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R7327	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R7328	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R7330	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W(5050P)
R7331	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R7332	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R7333	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R7335	1-216-073-00	METAL GLAZE	10K	5%	1/10W(5050P)
R7336	1-216-073-00	METAL GLAZE	10K	5%	1/10W(5050P)
R7337	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W(5050P)
R7339	1-216-049-11	METAL GLAZE	1K	5%	1/10W(5050P)
R7340	1-216-073-00	METAL GLAZE	10K	5%	1/10W(5050P)
R7341	1-216-073-00	METAL GLAZE	10K	5%	1/10W(5050P)
R7343	1-216-049-11	METAL GLAZE	1K	5%	1/10W(5050P)
R7344	1-216-073-00	METAL GLAZE	10K	5%	1/10W(5050P)
R7345	1-216-073-00	METAL GLAZE	10K	5%	1/10W(5050P)
R7347	1-216-049-11	METAL GLAZE	1K	5%	1/10W(5050P)
R7348	1-216-073-00	METAL GLAZE	10K	5%	1/10W(5050P)
R7349	1-216-073-00	METAL GLAZE	10K	5%	1/10W(5050P)
R7351	1-216-049-11	METAL GLAZE	1K	5%	1/10W
R7352	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R7353	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R7355	1-249-411-11	CARBON	330	5%	1/4W
R7359	1-216-073-00	METAL GLAZE	10K	5%	1/10W(5050P)
R7360	1-216-073-00	METAL GLAZE	10K	5%	1/10W(5050P)
R7361	1-216-049-11	METAL GLAZE	1K	5%	1/10W(5050P)
R7363	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W(5050P)
R7364	1-216-073-00	METAL GLAZE	10K	5%	1/10W(5050P)
R7365	1-216-073-00	METAL GLAZE	10K	5%	1/10W(5050P)
R7366	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R7368	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R7370	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R7376	1-216-073-00	METAL GLAZE	10K	5%	1/10W(1000P)
R7377	1-216-073-00	METAL GLAZE	10K	5%	1/10W(1000P)
R7378	1-216-073-00	METAL GLAZE	10K	5%	1/10W(1000P)
R7379	1-216-073-00	METAL GLAZE	10K	5%	1/10W(1000P)
R7380	1-216-049-11	METAL GLAZE	1K	5%	1/10W
R7381	1-216-049-11	METAL GLAZE	1K	5%	1/10W
R7382	1-216-049-11	METAL GLAZE	1K	5%	1/10W
		<TRANSFORMER>			
T2001	1-433-370-11	TRANSFORMER, OSC			
		<VARIABLE RESISTOR>			
VR101	1-228-995-00	RES, ADJ, CARBON 22K			
VR102	1-228-991-00	RES, ADJ, CARBON 2.2K			
VR103	1-228-993-00	RES, ADJ, CARBON 4.7K			
VR104	1-228-994-00	RES, ADJ, CARBON 10K			
VR181	1-228-991-00	RES, ADJ, CARBON 2.2K			
VR201	1-228-997-00	RES, ADJ, CARBON 100K			
		<CRYSTAL>			
X1001	1-760-047-11	CRYSTAL			
X1101	1-577-667-11	CRYSTA, OSC			
X3001	1-579-220-11	CRYSTAL, OSC (32 KHz)			
X3002	1-767-200-11	CRYSTA, OSC			
X7101	1-233-491-11	CERAMIC OSC 4.000 MHz			

Ref.No	Part No.	Description			Remark
		<BATTERY, RECHAGEABLE>			
Z3001	*1-528-723-11	BATTERY, RECHAGEABLE			

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Ref.No	Part No.	Description			Remark
	*A-6756-374-A	MC-4 BOARD, COMPLETE ********************			
	1-808-722-11	DIODE LN59			

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Ref.No	Part No.	Description			Remark
	*A-6756-375-A	MC-1 BOARD, COMPLETE ********************			
	1-249-405-11	CARBON	100	5%	1/4W F
	1-249-410-11	CARBON	270	5%	1/4W F
	1-762-311-11	SWITCH, LEAF (1P-1T)			
	1-808-723-11	PHOTO COUPLER SPI-315-04-C			
	3-735-744-01	SPACER, PHOTO SENSOR			

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Ref.No	Part No.	Description			Remark
	*A-6796-465-A	PW-1 BOARD, COMPLETE ********************			
		<CAPACITOR>			
C5001	⚠1-130-791-11	FILM	0.068MF	5%	250V
C5002	⚠1-130-791-11	FILM	0.068MF	5%	250V
C5004	⚠1-115-383-11	CERAMIC	1000PF	10%	400V
C5005	⚠1-115-383-11	CERAMIC	1000PF	10%	400V
C5010	1-125-554-11	ELECT	47MF	20%	400V
C5011	1-137-542-11	MT-POLYEST	0.047PF		630V
C5012	1-104-596-11	CERAMIC	39MF	5%	50V
C5014	1-130-478-00	MYLAR	0.0039MF	5%	50V
C5015	1-126-947-11	ELECT	47MF	20%	35V
C5016	1-136-165-00	FILM	0.1MF	5%	50V
C5017	1-130-479-00	MYLAR	0.0047MF	5%	50V
C5018	1-136-165-00	FILM	0.1MF	5%	50V
C5101	1-124-525-11	ELECT	1000MF	20%	25V
C5102	1-104-666-11	ELECT	220MF	20%	25V
C5103	1-124-525-11	ELECT	1000MF	20%	25V
C5104	1-104-666-11	ELECT	220MF	20%	25V
C5105	1-126-947-11	ELECT	47MF	20%	35V
C5106	1-126-176-11	ELECT	220MF	20%	10V
C5107	1-161-063-00	CERAMIC	0.1MF	10%	50V
C5108	1-124-455-00	ELECT	100MF	20%	16V
C5110	1-124-257-00	ELECT	2.2MF	20%	50V
C5115	1-161-063-00	CERAMIC	0.1MF	10%	50V
		<DIODE>			
D5001	1-809-768-11	DIODE DBC10G			
D5002	1-808-898-11	DIODE AP01C-V0			
D5003	8-719-901-83	DIODE 1SS83			
D5011	⚠1-809-752-11	PHOTO COUPLER PC120FB			
D5101	1-810-795-11	DIODE RL2Z-LF-C4			
D5102	1-810-795-11	DIODE RL2Z-LF-C4			
D5103	8-719-901-83	DIODE 1SS83			
D5104	1-808-899-11	DIODE AG01-V2			
D5105	8-719-300-45	DIODE EM-1Z			
D5106	8-719-110-03	DIODE RD7.5ESB2			
D5110	1-809-070-11	DIODE AK04-V2			
D5111	1-809-070-11	DIODE AK04-V2			

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

Ref.No	Part No.	Description			Remark
		<FUSE>			
F5001	⚠1-532-297-11	QUICK-ACTING FUSE			
Y5001	1-533-583-11	HOLDER, FUSE			
Y5002	1-533-583-11	HOLDER, FUSE			
		<IC>			
IC501	8-759-073-29	IC TDA4605-3			
IC511	1-810-060-11	IC L5431-AA			
IC512	8-759-513-72	IC PQ12RF11			
		<INDUCTOR>			
L5002	⚠1-411-248-11	FILTER, LINE			
L5003	1-414-540-11	INDUCTOR OUH			
L5101	1-410-509-11	INDUCTOR 10UH			
L5102	1-410-509-11	INDUCTOR 10UH			
L5103	1-414-540-11	INDUCTOR OUH			
L5401	1-414-540-11	INDUCTOR OUH			
L5402	1-414-540-11	INDUCTOR OUH			
L5403	1-414-540-11	INDUCTOR OUH			
L5404	1-414-540-11	INDUCTOR OUH			
L5405	1-414-540-11	INDUCTOR OUH			
		<PROTECTOR>			
PR511	⚠1-533-726-11	PROTECTOR, IC 1.0A 50V			
		<TRANSISTOR>			
Q5001	8-729-027-98	TRANSISTOR 2SK1460LS			
		<RESISTOR>			
R5002	⚠1-202-724-11	SOLID	2.7M	10%	1/2W
R5010	1-215-903-11	METAL OXIDE	68K	5%	2W
R5011	1-247-893-11	CARBON	390K	5%	1/4W
R5012	1-247-893-11	CARBON	390K	5%	1/4W
R5013	1-247-889-00	CARBON	270K	5%	1/4W
R5014	1-247-889-00	CARBON	270K	5%	1/4W
R5015	1-249-430-11	CARBON	12K	5%	1/4W
R5016	1-249-423-11	CARBON	3.3K	5%	1/4W
R5017	1-249-409-11	CARBON	220	5%	1/4W
R5018	1-249-429-11	CARBON	10K	5%	1/4W
R5019	1-249-389-11	CARBON	4.7	5%	1/4W
R5020	1-249-429-11	CARBON	10K	5%	1/4W
R5021	1-249-417-11	CARBON	1K	5%	1/4W
R5022	1-249-433-11	CARBON	22K	5%	1/4W
R5023	1-249-433-11	CARBON	22K	5%	1/4W
R5024	1-249-433-11	CARBON	22K	5%	1/4W
R5025	1-249-433-11	CARBON	22K	5%	1/4W
R5101	⚠1-212-851-11	FUSIBLE	5.6	5%	1/4W
R5103	1-249-429-11	CARBON	10K	5%	1/4W
R5105	1-249-415-11	CARBON	680	5%	1/4W
R5106	1-214-723-00	METAL	560	1%	1/4W
R5107	1-214-127-00	METAL	620	1%	1/4W
R5108	1-214-707-00	METAL	120	1%	1/4W
R5110	1-249-413-11	CARBON	470	5%	1/4W
R5111	1-249-415-11	CARBON	680	5%	1/4W
R5112	1-249-430-11	CARBON	12K	5%	1/4W
		<TRANSFORMER>			
T5001	⚠1-429-799-11	TRANSFORMER, PULSE POWER			
		<VARISTOR>			
VA501	⚠1-801-123-11	VARISTOR ENC4710D-05AS			

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Ref.No	Part No.	Description			Remark
	*A-6796-467-A	TM-2 BOARD, COMPLETE ********************			
		<CONNECTOR>			
CN7201	1-351-505-11	CONNECTOR, 14P			
		<DIODE>			
D7201	8-719-301-58				
D7203	8-719-912-20	DIODE 1SS120			
D7205	8-719-912-20	DIODE 1SS120			
D7206	8-719-912-20	DIODE 1SS120			
D7207	8-719-912-20	DIODE 1SS120			
D7208	8-719-912-20	DIODE 1SS120			
D7209	8-719-912-20	DIODE 1SS120			
D7210	8-719-912-20	DIODE 1SS120			
D7211	8-719-912-20	DIODE 1SS120			
D7212	1-809-687-11	LED SEL2910D-TP2-D			
		<TRANSISTOR>			
Q7201	8-729-206-20	TRANSISTOR RN1202			
		<RESISTOR>			
R7201	1-249-419-11	CARBON	1.5K	5%	1/4W
R7202	1-249-408-11	CARBON	180	5%	1/4W
R7205	1-249-419-11	CARBON	1.5K	5%	1/4W
R7206	1-249-407-11	CARBON	150	5%	1/4W
		<SWITCH>			
S7201	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7202	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7203	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7204	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7206	1-762-802-11	SWITCH, SLIDE (2P-2T)			
S7207	1-762-803-11	SWITCH, SLIDE (2P-3T)			
S7208	1-762-803-11	SWITCH, SLIDE (2P-3T)			
S7210	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7211	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7212	1-762-802-11	SWITCH, SLIDE (2P-2T)			
		<VARIABLE RESISTOR>			
VR721	1-241-641-11	VR, ROTARY 1KB			
		<HOLDER>			
Y7202	*3-972-310-01	HOLDER, LED			

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Ref.No	Part No.	Description			Remark
	*A-6796-468-A	VP-1 BOARD, COMPLETE ********************			
		<CAPASITOR>			
C1801	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1804	1-162-284-31	CERAMIC	150PF	10%	50V
C1805	1-162-285-31	CERAMIC	180PF	10%	50V
C1807	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1808	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1809	1-162-209-31	CERAMIC	27PF	5%	50V
C1810	1-162-199-31	CERAMIC	10PF	5%	50V
C1811	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1812	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1813	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1817	1-126-154-11	ELECT	47MF	20%	6.3V
C1818	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1831	1-101-880-00	CERAMIC	47PF	5%	50V
C1832	1-164-064-11	CERAMIC	56PF	5%	50V
C1833	1-162-292-31	CERAMIC	680PF	10%	50V

Ref.No	Part No.	Description			Remark
C1834	1-162-211-31	CERAMIC	33PF	5%	50V
C1836	1-162-211-31	CERAMIC	33PF	5%	50V
C1837	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1839	1-126-154-11	ELECT	47MF	20%	6.3V
C1840	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1881	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1882	1-127-550-11	ELECT(SOLID)	3.3MF	20%	16V
C1883	1-161-053-00	CERAMIC	0.015MF	10%	25V
C1884	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1885	1-124-252-00	ELECT	0.33MF	20%	50V
C1886	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1887	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1890	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1892	1-161-379-00	CERAMIC	0.01MF	20%	25V
C1893	1-161-021-11	CERAMIC	0.047MF	10%	25V
C1894	1-161-021-11	CERAMIC	0.047MF	10%	25V
C1895	1-161-021-11	CERAMIC	0.047MF	10%	25V
C1896	1-161-021-11	CERAMIC	0.047MF	10%	25V
C1897	1-161-379-00	CERAMIC	0.01MF	20%	25V
		<CONNECTOR>			
CN181	1-251-395-11	SOCKET, FFC (7P)			
		<JACK>			
JK851	1-695-522-11	MIC JACK			
		<DIODE>			
D1881	8-719-912-20	DIODE 1SS120			
		<IC>			
IC181	1-809-673-11	IC LA7374			
		<INDUCTOR>			
L1803	1-410-519-11	INDUCTOR 68UH			
L1804	1-410-335-11	INDUCTOR 150UH			
L1805	1-410-512-11	INDUCTOR 18UH			
L1831	1-410-511-11	INDUCTOR 15UH			
L1832	1-410-511-11	INDUCTOR 15UH			
L1833	1-410-521-11	INDUCTOR 100UH			
L1834	1-410-517-11	INDUCTOR 47UH			
L1835	1-410-506-11	INDUCTOR 5.6UH			
		<TRANSISTOR>			
Q1801	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q1802	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q1803	8-729-900-89	TRANSISTOR DTC144ES			
Q1804	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q1805	1-801-259-11	TRANSISTOR 2SA1782S			
Q1806	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q1807	8-729-900-89	TRANSISTOR DTC144ES			
Q1808	8-729-900-89	TRANSISTOR DTC144ES			
Q1809	8-729-900-89	TRANSISTOR DTC144ES			
Q1831	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q1832	8-729-266-83	TRANSISTOR 2SC2668-Y			
Q1833	8-729-900-89	TRANSISTOR DTC144ES			
Q1834	8-729-266-83	TRANSISTOR 2SC2668-Y			
Q1835	1-801-259-11	TRANSISTOR 2SA1782S			
		<RESISTOR>			
R1801	1-249-419-11	CARBON	1.5K	5%	1/4W
R1803	1-249-423-11	CARBON	3.3K	5%	1/4W
R1804	1-249-427-11	CARBON	6.8K	5%	1/4W
R1805	1-249-426-11	CARBON	5.6K	5%	1/4W
R1806	1-249-423-11	CARBON	3.3K	5%	1/4W
R1807	1-249-418-11	CARBON	1.2K	5%	1/4W
R1808	1-249-429-11	CARBON	10K	5%	1/4W
R1809	1-249-429-11	CARBON	10K	5%	1/4W
R1810	1-249-417-11	CARBON	1K	5%	1/4W
R1811	1-249-417-11	CARBON	1K	5%	1/4W
R1812	1-249-417-11	CARBON	1K	5%	1/4W
R1813	1-249-416-11	CARBON	820	5%	1/4W
R1814	1-249-414-11	CARBON	560	5%	1/4W
R1815	1-249-417-11	CARBON	1K	5%	1/4W
R1816	1-249-422-11	CARBON	2.7K	5%	1/4W
R1817	1-249-417-11	CARBON	1K	5%	1/4W
R1818	1-249-433-11	CARBON	22K	5%	1/4W
R1819	1-249-433-11	CARBON	22K	5%	1/4W
R1820	1-249-417-11	CARBON	1K	5%	1/4W
R1821	1-249-424-11	CARBON	3.9K	5%	1/4W
R1822	1-249-422-11	CARBON	2.7K	5%	1/4W
R1823	1-249-421-11	CARBON	2.2K	5%	1/4W
R1831	1-249-417-11	CARBON	1K	5%	1/4W
R1832	1-249-416-11	CARBON	820	5%	1/4W
R1833	1-249-416-11	CARBON	820	5%	1/4W
R1834	1-249-412-11	CARBON	390	5%	1/4W
R1835	1-247-828-11	CARBON	750	5%	1/4W
R1836	1-249-419-11	CARBON	1.5K	5%	1/4W
R1837	1-249-415-11	CARBON	680	5%	1/4W
R1838	1-249-415-11	CARBON	680	5%	1/4W
R1840	1-249-420-11	CARBON	1.8K	5%	1/4W
R1841	1-249-420-11	CARBON	1.8K	5%	1/4W
R1842	1-249-417-11	CARBON	1K	5%	1/4W
R1843	1-249-417-11	CARBON	1K	5%	1/4W
R1881	1-249-430-11	CARBON	12K	5%	1/4W
R1882	1-249-426-11	CARBON	5.6K	5%	1/4W
R1883	1-249-417-11	CARBON	1K	5%	1/4W
R1884	1-249-417-11	CARBON	1K	5%	1/4W
R1887	1-249-427-11	CARBON	6.8K	5%	1/4W
R1889	1-249-435-11	CARBON	33K	5%	1/4W
R1891	1-249-421-11	CARBON	2.2K	5%	1/4W
R1892	1-249-433-11	CARBON	22K	5%	1/4W
		<VARIABLE RESISTOR>			
VR182	1-228-991-00	RES, ADJ, CARBON 2.2K			

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Ref.No	Part No.	Description			Remark
	*A-6796-474-A	TM-1 BOARD, COMPLETE (1000P)			
	*A-6796-466-A	TM-1 BOARD, COMPLETE (5050P)			
		********************			
A7101	1-519-675-11	INDICATOR TUBE, FLUORESCENT			
		<CAPACITOR>			
C7101	1-162-210-31	CERAMIC	30PF	5%	50V(5050P)
C7102	1-162-210-31	CERAMIC	30PF	5%	50V(5050P)
C7103	1-124-589-11	ELECT	47MF	20%	16V
C7104	1-161-379-00	CERAMIC	0.01MF	20%	25V
C7105	1-161-063-00	CERAMIC	0.1MF	10%	50V
C7108	1-164-073-11	CERAMIC	100PF	10%	50V(1000P)
C7110	1-162-291-31	CERAMIC	560PF	10%	50V(1000P)
C7111	1-162-291-31	CERAMIC	560PF	10%	50V(1000P)
C7112	1-162-291-31	CERAMIC	560PF	10%	50V(1000P)
C7113	1-162-291-31	CERAMIC	560PF	10%	50V(1000P)
		<DIODE>			
D7101	8-719-912-20	DIODE 1SS120			
D7102	8-719-912-20	DIODE 1SS120			
D7103	8-719-912-20	DIODE 1SS120			
D7104	8-719-912-20	DIODE 1SS120			
D7105	8-719-912-20	DIODE 1SS120			
D7130	8-719-901-83	DIODE 1SS83			
D7136	8-719-912-20	DIODE 1SS120			
D7138	8-719-912-20	DIODE 1SS120			
D7142	8-719-912-20	DIODE 1SS120			
		<IC>			
IC711	1-801-355-11	IC MN12510			
		<RESISTOR>			
R7102	1-249-414-11	CARBON	560	5%	1/4W
R7103	1-249-414-11	CARBON	560	5%	1/4W
R7104	1-249-414-11	CARBON	560	5%	1/4W
R7105	1-249-414-11	CARBON	560	5%	1/4W
R7106	1-249-441-11	CARBON	100K	5%	1/4W
R7107	1-249-441-11	CARBON	100K	5%	1/4W
R7108	1-249-441-11	CARBON	100K	5%	1/4W
R7109	1-249-441-11	CARBON	100K	5%	1/4W
R7114	1-249-439-11	CARBON	68K	5%	1/4W
R7115	1-249-439-11	CARBON	68K	5%	1/4W
R7116	1-249-439-11	CARBON	68K	5%	1/4W
R7117	1-249-439-11	CARBON	68K	5%	1/4W
R7118	1-249-439-11	CARBON	68K	5%	1/4W
R7120	1-249-425-11	CARBON	4.7K	5%	1/4W
R7121	1-249-425-11	CARBON	4.7K	5%	1/4W
R7122	1-249-439-11	CARBON	68K	5%	1/4W
R7123	1-249-439-11	CARBON	68K	5%	1/4W
R7124	1-249-439-11	CARBON	68K	5%	1/4W
R7125	1-249-439-11	CARBON	68K	5%	1/4W
		<SWITCH>			
S7105	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7106	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7107	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7108	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7109	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7110	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7112	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7113	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7114	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7115	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7116	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7117	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7118	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7119	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7120	1-762-303-11	SWITCH, PUSH (1P-1T)			
S7129	1-762-303-11	SWITCH, PUSH (1P-1T)			
		<CRYSTAL>			
X7101	1-233-491-11	CERAMIC OSC 4.000MHz			
		<HOLDER>			
Y7101	*3-946-542-01	HOLDER			

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Ref.No	Part No.	Description			Remark
	*A-6796-475-A	TB-1 BOARD, COMPLETE (1000P)			
	*A-6796-469-A	TB-1 BOARD, COMPLETE (5050P)			
		********************			
		<CAPACITOR>			
C8502	1-126-154-11	ELECT	47MF	20%	6.3V
C8503	1-111-241-11	ELECT	10MF	20%	16V
C8504	1-164-073-11	CERAMIC	100PF	10%	50V
C8505	1-161-063-00	CERAMIC	0.1MF	10%	50V
C8507	1-161-063-00	CERAMIC	0.1MF	10%	50V(5050P)
C8508	1-161-063-00	CERAMIC	0.1MF	10%	50V
C8509	1-162-294-31	CERAMIC	0.001MF	10%	50V
C8510	1-161-063-00	CERAMIC	0.1MF	10%	50V
C8511	1-111-241-11	ELECT	10MF	20%	16V
C8512	1-162-294-31	CERAMIC	0.001MF	10%	50V
C8513	1-162-294-31	CERAMIC	0.001MF	10%	50V
C8514	1-124-257-00	ELECT	2.2MF	20%	50V
C8515	1-161-063-00	CERAMIC	0.1MF	10%	50V
C8517	1-162-294-31	CERAMIC	0.001MF	10%	50V(1000P)
C8518	1-161-063-00	CERAMIC	0.1MF	10%	50V(5050P)
C8519	1-111-241-11	ELECT	10MF	20%	16V
C8520	1-161-063-00	CERAMIC	0.1MF	10%	50V(5050P)
C8521	1-161-063-00	CERAMIC	0.1MF	10%	50V(5050P)
C8522	1-161-063-00	CERAMIC	0.1MF	10%	50V(5050P)
C8523	1-161-063-00	CERAMIC	0.1MF	10%	50V(5050P)
C8524	1-161-063-00	CERAMIC	0.1MF	10%	50V(5050P)
C8525	1-161-063-00	CERAMIC	0.1MF	10%	50V(5050P)
C8526	1-161-063-00	CERAMIC	0.1MF	10%	50V(5050P)
		<DIODE>			
D8513	8-719-110-41	DIODE RD15ESB2			
D8514	8-719-110-41	DIODE RD15ESB2			
		<IC>			
IC851	8-759-943-94	IC BA15218			
		<JACK>			
JK855	1-695-522-11	JACK, MICROPHONE			
JK856	1-750-561-11	JACK, HEADPHON (5050P)			
		<RESISTOR>			
R8501	1-249-437-11	CARBON	47K	5%	1/4W
R8503	1-249-429-11	CARBON	10K	5%	1/4W
R8504	1-249-429-11	CARBON	10K	5%	1/4W
R8505	1-249-429-11	CARBON	10K	5%	1/4W
R8506	1-249-441-11	CARBON	100K	5%	1/4W
R8507	1-249-436-11	CARBON	39K	5%	1/4W
R8508	1-249-405-11	CARBON	100	5%	1/4W
R8509	1-249-419-11	CARBON	1.5K	5%	1/4W
R8510	1-247-804-11	CARBON	75	5%	1/4W
R8514	1-249-401-11	CARBON	47	5%	1/4W (5050P)
R8514	1-249-429-11	CARBON	10K	5%	1/4W (1000P)
R8515	1-249-417-11	CARBON	1K	5%	1/4W (1000P)
R8516	1-249-417-11	CARBON	1K	5%	1/4W (1000P)
R8517	1-249-417-11	CARBON	1K	5%	1/4W (1000P)
R8518	1-249-417-11	CARBON	1K	5%	1/4W (1000P)
R8522	1-249-429-11	CARBON	10K	5%	1/4W (1000P)
R8523	1-249-429-11	CARBON	10K	5%	1/4W (1000P)
		<RELAY>			
RY851	1-755-140-11	RELAY			
RY852	1-755-140-11	RELAY			

****

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifies par une trame et une marque ⚠ sont critiques pour la securite.
Ne les remplacer que par une piece portant le numero specifie.

Ref.No	Part No.	Description	Remark
		MISCELLANEOUS *************	
105	1-808-710-11	PHOTO TRANSISTOR	
217	1-808-722-11	DIODE LN59	
308	*1-406-902-11	COIL, MOTOR (STATOR)	
310	*1-461-017-11	ROTOR	
357	1-762-312-11	SHUTTLE, JOG	
365	*1-589-269-11	MOUNTED BOARD (MC-3)	
366	1-810-708-11	SENSOR, DEW (R-SPECIAL)	

****

Ref.No	Part No.	Description	Remark
	ACCESSORIES & PACKING MATERIALS ********************************		
	⚠1-534-827-14	CORD, POWER UK	
	3-856-939-11	MANUAL, INSTRUCTION (SVT-5050P)	
	3-856-969-11	MANUAL, INSTRUCTION (SVT-1000P)	

****

Ref.No	Part No.	Description	Remark
		HARDWARE LIST *************	
#1	7-621-732-08	SET-SCT,HEX. 2X3 FLAT POINT	
#2	7-621-775-20	SCREW +B 2.6X5	
#3	7-624-105-04	STOP RING 2.3, TYPE -E	
#4	7-682-547-09	SCREW +B 3X6	
#5	7-682-648-09	SCREW (3X8), +PW	
#6	7-682-903-01	SCREW (3X4), +PWH	
#7	7-685-107-01	SCREW (2.3X12), +PTP	
#8	7-685-131-19	SCREW +BTP 2.6X4 TYPE2 N-S	
#9	7-685-133-19	SCREW, TOTSU PTP 2.6X6 TYPE2	
#10	7-685-534-19	SCREW +BTP 2.6X8 TYPE2 N-S	
#11	7-685-547-19	SCREW +BTP 3X10 TYPE2 N-S	
#12	7-685-645-79	SCREW +BTP 3X6 TYPE2 N-S	
#13	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
#14	7-685-661-19	SCREW +BVTP 4X12 TYPE2 N-S	

****

Ref.No	Part No.	Description	Remark

SECTION 7
MECHANISM ADJUSTMENTS

7-1. OPERATING THE MECHANISM WITH NO CASSETTE INSERTED (See Fig. 7-1-1.)

1) Attach black vinyl tape to the T. END and T. TOP sensors to prevent light from entering.
2) Push the TRAY LOCK LEVER in the direction of the arrow to maintain the unlocked condition. Release the lever just before the TRAY starts moving down.
3) In this condition, operation is possible in every mode. However, the following procedures are necessary to operate the unit in the REC, REW and R-SEARCH modes.

REC mode :	Push the SAFETY SW LEVER to turn the SAFETY SWITCH (Erasure Prevention Switch) ON, then press the REC button. If the SAFETY SWITCH is not turned ON, the unit will enter the EJECT mode.
REW/R-SEARCH :	After pressing the REW button, turn the TAKE-UP REEL ASS'Y by hand. Otherwise, the reel sensor will operate, setting the INITIAL mode after 2 to 3 seconds.

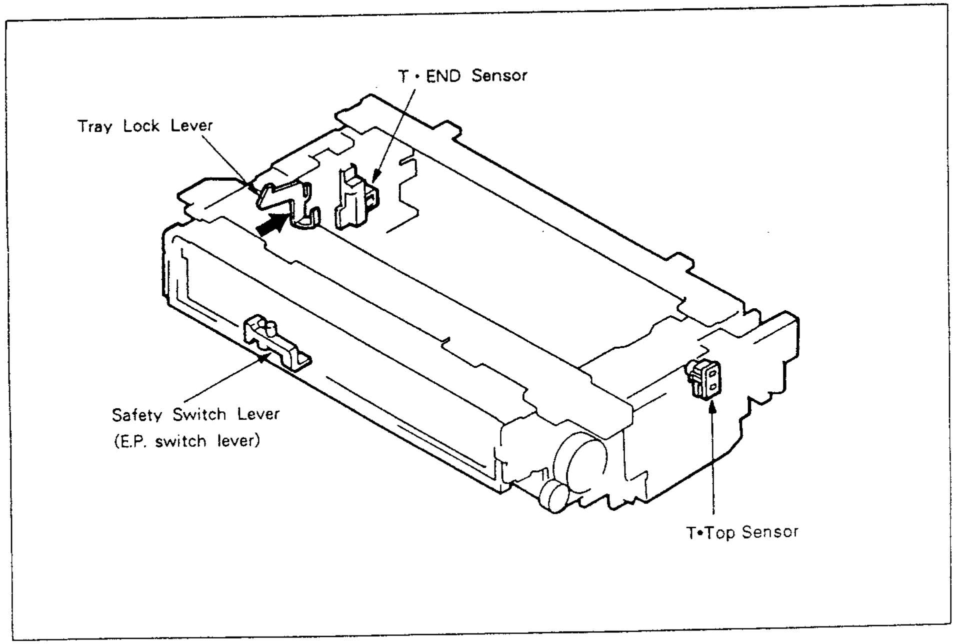


Fig. 7-1-1. Preparations for Adjustment

7-2. REEL TABLE HEIGHT ADJUSTMENT AND TORQUE CHECK

7-2-1. Reel Table Height (See Fig. 7-2-1.)

If the SUPPLY REEL ASS'Y or the TAKE-UP REEL ASS'Y is raplaced, it will be necessary to adjust the REEL TABLE height.

(1) Remove the COMPL CASSETTE MECHANISM as instructed in P.22.

(2) Attach the master plane (H-7099-279-H) and reel disc height jig (H-7099-038-H) in the direction of the arrows.

(3) Confirm that, when the gauge stops, the REEL TABLEs are not in contact with surface A of the plate and side of the REEL TABLEs are in contact with surface B.

(4) If the REEL TABLE is in contact with surface A, remove a spacer and check again.

(5) If the REEL TABLE is not in contact with surface B, add a spacer and check again.

(6) Remove the master plane.

(7) Set the EJECT mode with the mode selector.

(8) Mount the COMPL CASSETTE MECHANISM as instructed in P.22.

Note:

- Adjust the reel table height by adding or removing spacers(0.13t, 0.25t, 0.3t, 0.4t and 0.5t)as appropriate so that the height meets the specifications. Use the same method for both the TAKE-UP REEL TABLE and the SUPPLY REEL TABLE.
  (The 0.5t washer is included as the standard washer for the SUPPLY REEL ASS'Y. The 0.4t washer is included as the standard washer for the TAKE-UP REEL ASS'Y.)
- If the height of the reel table is not within the specified value, the tape edge might be damaged as a result, or the tape path adjustment might not be possible to make.

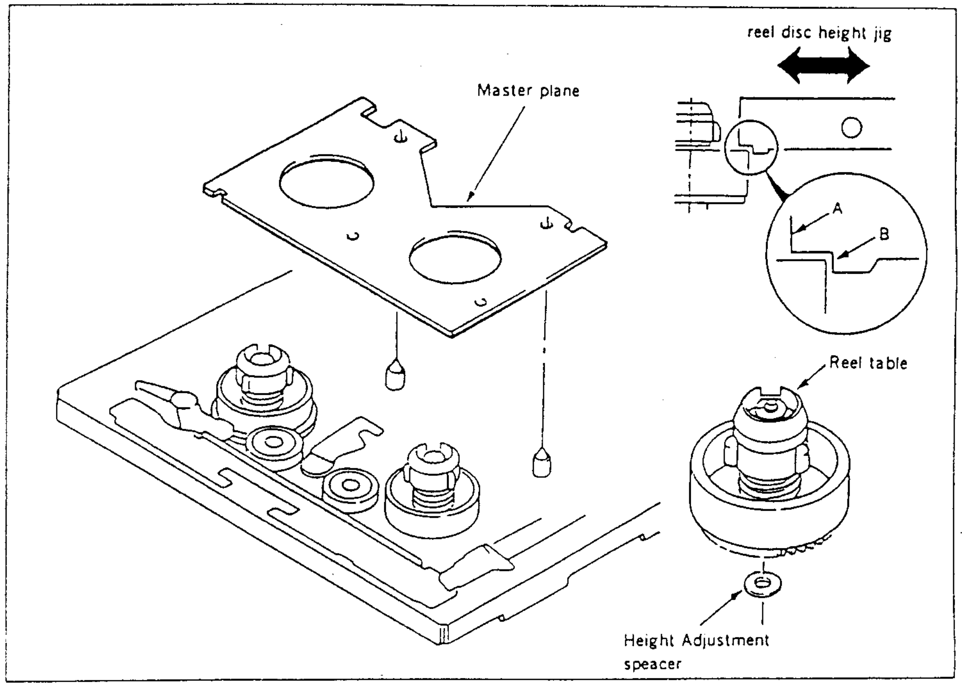


Fig. 7-2-1. Reel Table Height Adjustment

7-2-2. Torque Check (See Fig. 7-2-2.)

1) Set the unit to operating condition without a cassette inserted as instructed in 8-1.

2) Measure the SUPPLY REEL TABLE torque in the REW mode, and confirm that it is 750gcm or more. Perform this measurement keeping the torque gauge in a fixed position with your hand (locked torque).

3) Measure the TAKE-UP REEL TABLE torque in the F.FWD mode, and confirm that it is 600gcm or more (locked torque).

4) Measure the TAKE-UP REEL TABLE torque in the playback mode (SP tape speed), and confirm that it is within 80 through 140gcm (locked torque).

5) Measure the SUPPLY REEL TABLE torque in the REV (F-SEARCH) mode, and confirm that it is within 150 through 240 gcm (locked torque).

6) After confirming that torque readings are within the specifications for each mode, check the following :
   ⓐ Dirt on the capstan motor and the REEL PULLEY groove.
   ⓑ Deterioration of the REEL DRIVE BELT.
   ⓒ Deterioration of the FRICTION GEAR ASS'Y felt (torque during playback).
   ⓓ Wear and damage of the COMPL CLUTCH MECHANISM and the reel drive system gears.

Note1 : Items ⓑ, ⓒ and ⓓ require replacement if found defective.

Note2 : The measured value of torque during FF and REW represents the value 2 seconds after starting.

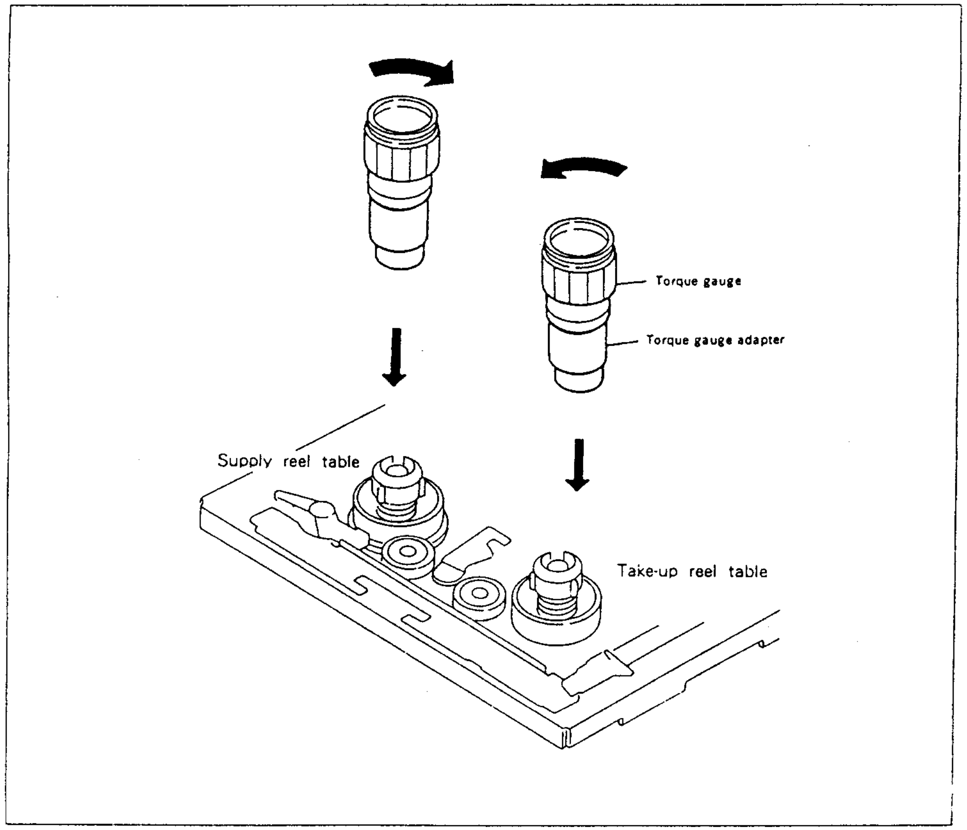


Fig. 7-2-2. Checking REW/FF/PLAY Torque

7-3. TENSION POLE (BACK TENSION GUIDE) POSITION ADJUSTMENT AND BACK TENSION TORQUE CHECK

7-3-1. Tension Pole (Back Tension Guide) Position Adjustment (See Fig. 7-3-1.)

1) Remove the COMPL CASSETTE MECHANISM as instructed in P.22.
2) Set the PLAY mode with the mode selector (VHJ-0050)
3) Confirm that the space between the end of chassis and the Tension arm is from 4mm to 6mm.
4) In case the tension pole is not withim 4-6mm, adjust it by loosening the screw ④ a little and changing the mounting position of the BAND HOLDER ⑤ in the direction of the arrow Ⓐ.
5) Set the EJECT mode with the mode selector.
6) Mount the COMPL CASSETTE MECHANISM as instructed in P.22.
7) Confirm that back tension torque is within 42± 5gcm, as instructed in 8-3-2 below.

7-3-2. Back Tension Torque Check (See Fig. 7-3-1.)

1) Attach the cassette torquemeter (VHJ-0016) and set the PLAY mode.
2) Confirm that back tension torque is within 50 ± 10gcm.
3) In case back tension torque dose not meet the above specification, proceed as follows:

ⓐ Clean the portion where the brake band (BAND HOLDER ASS'Y) ⑦ of the SUPPLY REEL ASS'Y ⑥ makes contact.

ⓑ Confirm that the brake band of the BAND HOLDER ASS'Y ⑦ does not make wear and that it is clean. If wear or dirt is found, replace the band holder assembly ⑦ as instructed in P.39.

ⓒ Raplace the TENSION LEVER ASS'Y SPRING COIL ⑧.

Note : Always follow procedures in 8-3-1. Tension Pole Position Adjustment after performing ⓐ, ⓑ and ⓒ.

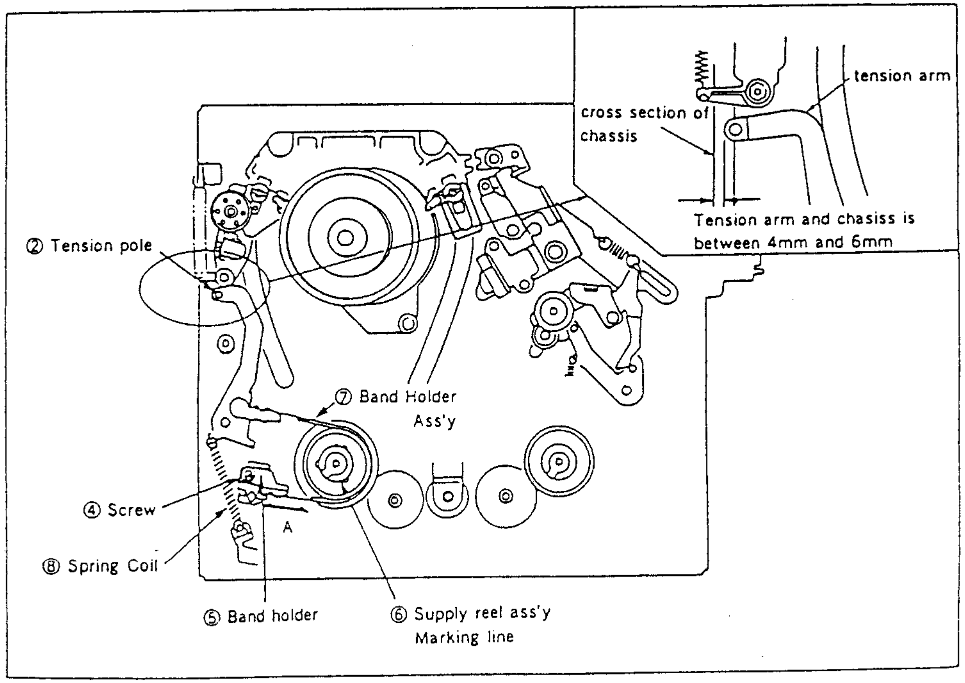

cross section of chassis
tension arm
Tension arm and chasiss is between 4mm and 6mm
② Tension pole
⑦ Band Holder Ass'y
④ Screw
A
⑧ Spring Coil
⑤ Band holder
⑥ Supply reel ass'y Marking line

Fig. 7-3-1. Tension Pole Positioning Adjustment

7-4. TAPE PATH ADJUSTMENT

The tape path mechanism is precisely adjusted at the factory. Normally no readjustment is required, but checking and/or adjustment is necessary when parts of the tape path mechanism among those shown in the figure below (See Fig. 8-4-1.) have been removed or replaced after a long period of use. This operation consists of adjusting the various guides so that the tape drawn out from the supply reel runs smoothly along the DRUM (CYLINDER) lead surface. A way of grasping the tape path condition by electronic means is monitoring the video head output envelope waveform with an oscilloscope. However, the fact that visual observation is essential in order to know whether the tape is running through the various guides in a smooth and natural way should be kept in mind when checking and adjusting.
Also remember that the position of tape guides is not greatly affected by the replacement of the UPPER DRUM (UPPER CYLINDER) or the COMPL DRUM (COMPL CYLINDER), provided that it is correctly performed, and that only the replaced parts should be adjusted after replacing a tape guide or COMPL HEAD BRACKET, since the position of the other tape guides shall not change considerably.

7-4-1. Preparations for Adjustment

(1) Clean the tape transport surfaces (See Fig. 8-4-1.).
(2) Connect the oscilloscope. Connect the channel 1 probe to the envelope waveform test point, and the channel 2 probe to the SW30 (RF SW P) test point. During adjustment, apply a trigger to the low side of the SW30 (RF SW P) in order to monitor the waveform output from channel 1 of the video head.

Note : Since oscilloscope connection points differ according to the model, refer to the "Test Point for Tape Path Adjustment" allocation figure in the electric circuit adjustment section of the service manual book.

(3) Use a dentist's mirror for visual observation of tape path condition.
(4) Use an eccentric driver (VHJ-0003) for adjustment of the guide rollers.
(5) When adjusting height of the fixed guide, guide rollers or COMPL head bracket, turn the special nut or the upper flange clockwise to push the tape downward, and counterclockwise to make the tape rise up.
(6) Do not use the damaged cassette tapes for tape path adjustment.

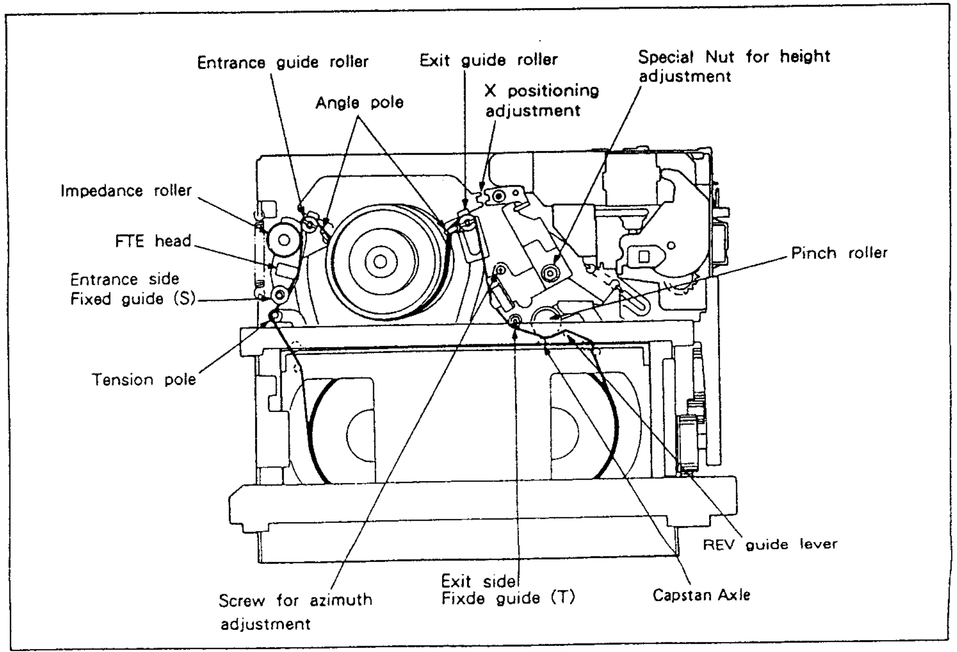

Entrance guide roller
Exit guide roller
Special Nut for height adjustment
X positioning adjustment
Angle pole
Impedance roller
FTE head
Entrance side Fixed guide (S)
Tension pole
Pinch roller
REV guide lever
Exit side Fixde guide (T)
Capstan Axle
Screw for azimuth adjustment

Fig. 7-4-1. Preparation for Adjustment

7-4-2. Adjustment by Visual Observation after Guide Roller, COMPL Head Bracket Replacement

Perform this adjustment after removing or replacing any of the above parts. Only for the replaced or removed parts, play back an alignment tape (MH-1) beforehand and adjust height by visual observation.

(1) Fixing Guide (See Fig. 8-4-2.)
Adjust so that the upper edge of the tape and the upper flange of the fixing guide, and the lower edge of the tape and the lower flange of the fixing guide do not touch. Also adjust so that clearances A and B become equal.

(2) Guide Rollers (See Fig. 8-4-3.)
The tape should not be curled by the guide roller upper and lower flanges. It should also run smoothly, without moving up and down on the DRUM (CYLINDER) lead surface.

Note : An excessive guide roller pressure may cause tape damage.

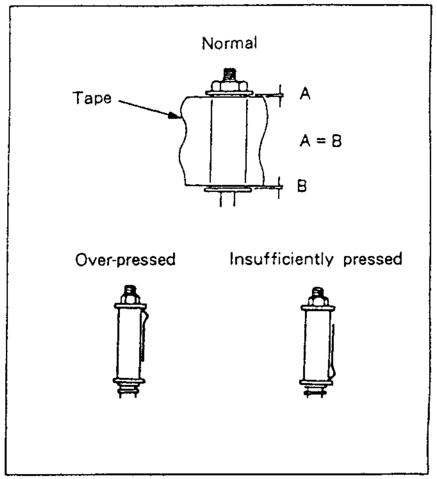

Normal
Tape
A
A = B
B
Over-pressed
Insufficiently pressed

Fig. 7-4-2. Temporary Adjustment of Fixing Guide

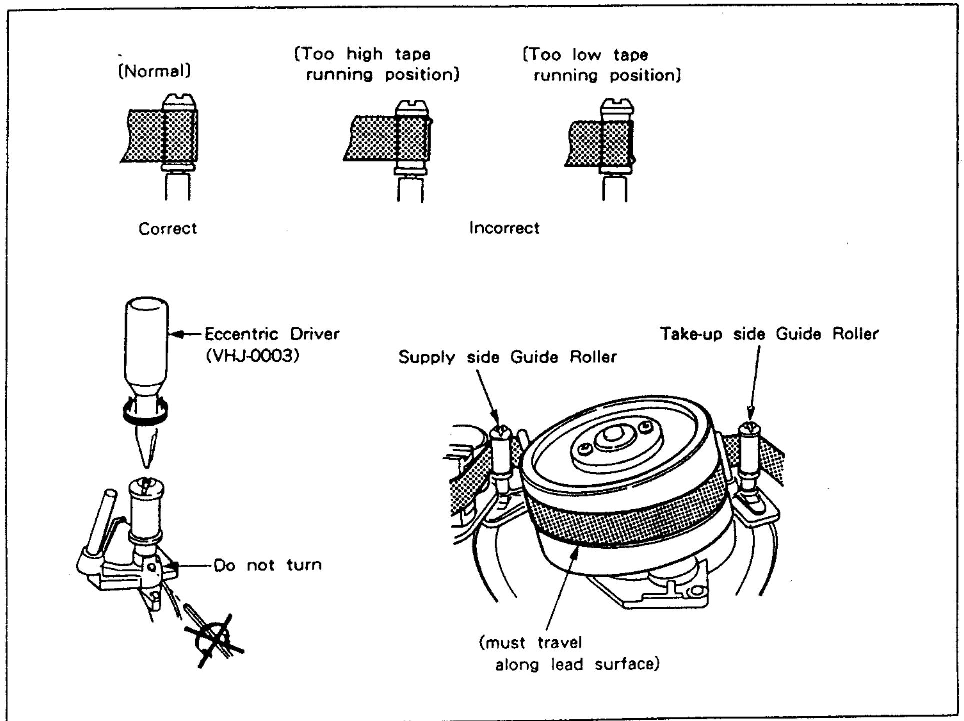

[Normal]
[Too high tape running position]
[Too low tape running position]
Correct
Incorrect
Eccentric Driver (VHJ-0003)
Supply side Guide Roller
Take-up side Guide Roller
Do not turn
(must travel along lead surface)

Fig. 7-4-3. (2) Pre-set for Guide Roller

(3) COMPL Head Bracket (ACE Head) (See Fig. 8-4-4.)
Adjust the special nut so that the tape edge runs between the audio head upper end and the control head lower end. Gaps A and B should be of about the same width. Since at this point it is only required that the control signal is picked up and the servo circuit works normally, no adjusting screws except the COMPL head bracket special nut should be touched.

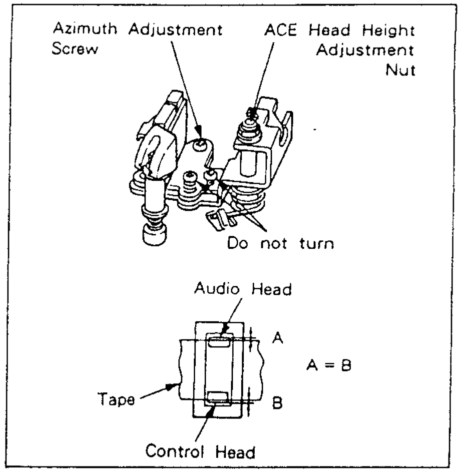

Azimuth Adjustment Screw
ACE Head Height Adjustment Nut
Do not turn
Audio Head
A
A = B
Tape
B
Control Head

Fig. 7-4-4. (3) Pre-set for Compl Head Bracket

7-4-3. Tape Path Check of Entrance Side Fixed Guide (S) (See Fig. 7-4-5.)

The fixed guide (S) of the entrance side does not require adjustment in this mechanism.
Confirm that the lower edge portion of the tape is running along the lower flange of the entrance side fixed guide (S).
The tape should not be curled by the entrance side fixed guide (S) upper and lower flanges.

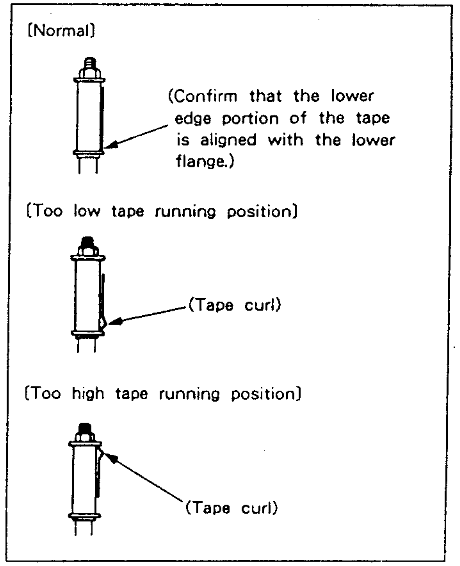

[Normal]
(Confirm that the lower edge portion of the tape is aligned with the lower flange.)
[Too low tape running position]
(Tape curl)
[Too high tape running position]
(Tape curl)

Fig. 7-4-5. Fixed Guide (S)

7-4-4. Guide Roller Adjustment (See Fig. 7-4-6.)

1) Play back the alignment tape (MH-1), press the tracking control key and adjust the envelope waveform to the maximum level.
2) Loosen the entrance and exit guide rollers by rotating them counterclockwise, then rotate them clockwise alternately until they are fastened and a flat video output waveform is obtained.
3) Confirm that the envelope waveform is not deformed, and check visually that no curling occurs at the guide roller upper and lower flanges.
4) Press the tracking control key and set the envelope waveform level to approx. 50% of the maximum. In this condition, confirm whether the envelope waveform is flat. It will not, showing valleys or peaks at the first half (entrance) or second half (exit), if the guide roller pressure is excessive or insufficient.
   In case there is unevenness in the first half (entrance), adjust the entrance side guide roller. If the second half (exit) shows trouble, adjust finely the exit side guide roller.

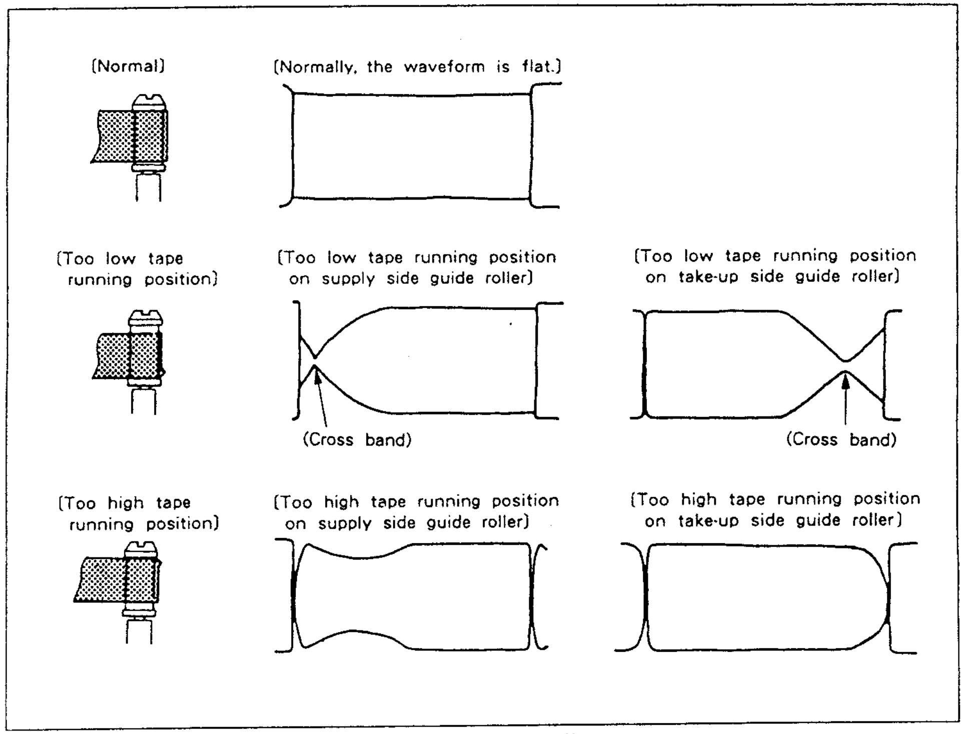

[Normal]
[Normally, the waveform is flat.]
[Too low tape running position]
[Too low tape running position on supply side guide roller]
[Too low tape running position on take-up side guide roller]
(Cross band)
(Cross band)
[Too high tape running position]
[Too high tape running position on supply side guide roller]
[Too high tape running position on take-up side guide roller]

Fig. 7-4-6. Guide Roller Adjustment

7-4-5. Tape Path Check of Exit Side Fixed Guide (T) (See Fig. 7-4-7.)

The fixed guide (T) of the exit side does not require adjustment in this mechanism.
Confirm that the lower edge portion of the tape is running close to the lower flange of the exit side fixed guide (T).
The tape should not be curled by the exit side fixed guide (T) upper and lower flanges.

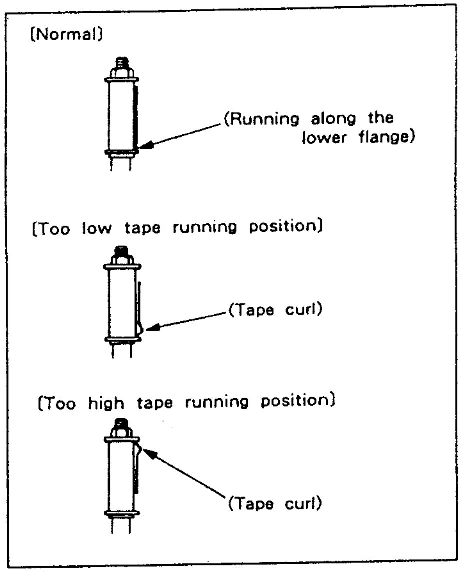

[Normal]
(Running along the lower flange)
[Too low tape running position]
(Tape curl)
[Too high tape running position]
(Tape curl)

Fig. 7-4-7. Fixed Guide (T)

7-4-6. COMPAL Head Bracket (ACE Head) Adjustment

(1) Height Adjustment and Azimuth Adjustment (See Fig. 8-4-8.)

1) Load the alignment tape (HiFi 400Hz) and set the PLAY mode.
2) Monitor the audio output waveform with the oscilloscope.
3) Rotate the azimuth adjustment screw until the audio output waveform amplitude is maximum.
4) After loosening the ACE head height adjustment special nut, rotate it slowly clockwise until amplitude of the audio output waveform is maximum, then adjust it finely clockwise to the point just before the said waveform amplitude begins to decrease.
5) Rotate the azimuth adjustment screw until amplitude of the audio output waveform is maximum.
6) Confirm that the audio output waveform amplitude does not fluctuate.

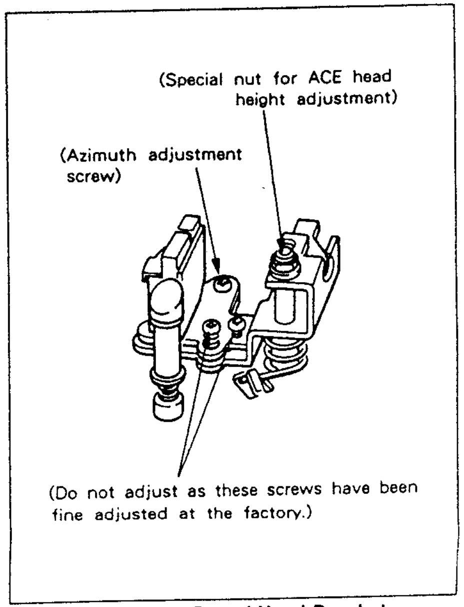

(Special nut for ACE head height adjustment)
(Azimuth adjustment screw)
(Do not adjust as these screws have been fine adjusted at the factory.)

Fig. 7-4-8. Compl Head Bracket

(2) Tracking (X Value) Adjustment (See Fig. 8-4-9.)

1) Load the alignment tape (MH-1) and set the PLAY mode.
2) Set tracking to the center position with the tracking control key (See Note below).
3) Rotate the stopper bracket fixing screw 180° counterclockwise.
4) Monitor the video head output envelope waveform with the oscilloscope.
5) Adjust the stopper bracket position so that amplitude of the envelope waveform becomes maximum at the tracking center and the envelope waveform amplitude changes by the same amount when shifting the tracking center by pressing the plus (+) and minus (−) tracking control keys.
6) Tighten the fixing screw.
7) (Model for LP mode tape speed capability) Playback the alignment tape (VHJ-0052) and set the tracking to the center using a tracking control key.
Then confirm that the playback picture on screen is normal. If not, Make readjustment by referring to items 1) through 7). To readjust, playback MH-1 and finely adjust the position of the stopper bracket within the range in which the amplitude of the envelope waveform can be held to a maximum.
8) Perform servo circuit SW PHASE (Switching position) adjustment.

Note : For models equipped with auto tracking, always set to the manual tracking mode before adjustment. To confirm the tracking center position, press the tracking keys (+, −) and observe the front panel clock display. It will read "T − : −" at the tracking center, "T − : , T − − : " when keeping the minus (−) key pressed, and "T : −, T : − −" when keeping the plus (+) key pressed. The time indication will be restored 2 to 3 seconds after the tracking keys are released.

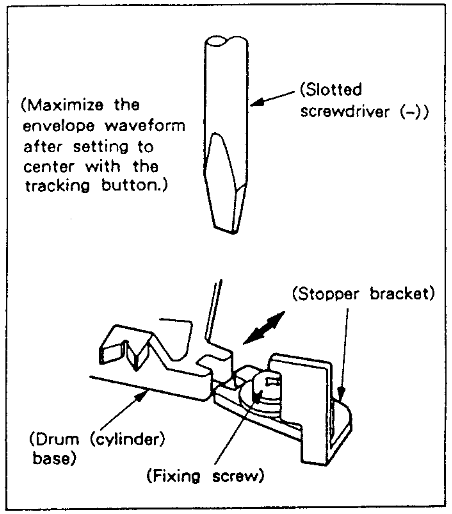

(Maximize the envelope waveform after setting to center with the tracking button.)
(Slotted screwdriver (−))
(Stopper bracket)
(Drum (cylinder) base)
(Fixing screw)

Fig. 7-4-9.

7-4-7. Checking After Adjustment

Tape running may show a slight change depending upon the type of the cassette tape (thick or thin tape), the start, middle, or end of cassette tape winding, etc. After performing the tape path adjustment with use of an alignment tape, be sure to check the following points. Incidentally, the alignment tape to be used should be E-180 or E-240 cassette should be a good one without any damage to it.

(1) Try to play back the alignment tape (MH-1) and confirm that the envelope waveform rise immediately and that there is no fluctuation in the envelope waveform and the audio output waveform.

(2) Load a cassette tape E-180 and start recording operation in the standard mode. 1 kHz should be fed to the audio input terminal when recording. After recording, the following points should be checked.

1. When the recorded portion is played back, the envelope waveform rise immediately, and no fluctuation in the envelope waveform is observed. Also, no speed drop occurs during the first half period or the last half period. Further, check to be sure that no fluctuation occurs in the audio waveform. Also confirm that neither the tape curling or derailing is caused on the upper or lower flange and the on the read side of the drum.
2. Confirm that no tape curling or derailing occurs in the upper or lower flange of each tape guide and the read side of the drum during each mode of operation, namely, FF, REW, F. SEARCH, and R. SEARCH.
3. Confirm that the envelope waveform rise immediately after changing the mode directly to the PLAY from each mode of FF, REW, F. SEARCH, R. SEARCH, or POWER OFF (INITIAL) and that no tape curling or derailing occurs in the upper or lower flange of the each tape guide and on the read side of the drum.

(3) Load a E-240 cassette tape and perform recording operation in the SP mode. 1 kHz should be fed to the audio input terminal when recording. Now, confirm that the envelope waveform rise immediately upon starting the playback of the recorded portion, and that neither fluctuation in the envelope waveform nor a speed drop occurs during the first half period or the last half period. Also confirm that no tape curling or derailing is caused in the upper or lower flange of each tape guide and on the drum lead surface.

(4) Perform recording for 60 seconds in the SP mode at the start of E-240 cassette winding. Play back the recorded portion and repeat the F.SEARCH ↔ R.SEARCH ten times, following which confirm that no damage is done to the tape edge. If any damage is found on the tape edge, a proper step must be taken as below depending upon the symptom obserbed.

1. When a sawtooth shaped damage is caused on underside of the tape edge by the REV guide
   1) Check to see if damage is done to the tape by the REV guide.
   2) Loosen the tilt adjustment screw of the ACE head bracket by turning it 135° counterclockwise.
   3) Make readjustment of the ACE head bracket (azimuth, height and adjustment of X value) by seeing item P.11.
   4) Confirm that no fluctuation in the audio level is caused by loosening the tilt adjustment screw in steps 1) and 2) above. Move the screw a little back if any fluctuation is found (but never move it back to the original position). After adjusting the tilt adjustment screw is readjusted, perform step 4) once again.
   5) Confirm again that the E-240 cassette tape does not sustain any damage.
   6) Perform the recording and playback on the E-180 and E-240 cassette tape and confirm that no fluctuation occurs in the envelope waveform and the audio waveform.

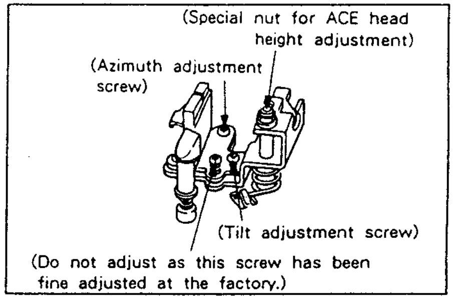

(Special nut for ACE head height adjustment)
(Azimuth adjustment screw)
(Tilt adjustment screw)
(Do not adjust as this screw has been fine adjusted at the factory.)

Fig. 7-4-10. Compl Head Bracket

2. If damage in the form of a sawtooth or a streak is found on the tape edge
   1) Check if a large amount of magnetic particles is adhered to the exit-side guide roller. If magnetic particles cannot be removed in spite of repeated cleaning, the guide roller must be replaced.
   2) Confirm if the tape is held too tightly by the exit-side guide roller, or if the last half of the envelope waveform is flat. If the type is found held too tightly, readjustment should be made by referring to 8-4.
   3) Recheck if the damage is still caused on the E-240 tape.
      If similar damage is still found on the tape, the exit-side guide roller should be loosened about 20° counterclockwise.
   4) Check once again that no fluctuation is caused in the envelope waveform or the audio waveform by loosening the exit-side guide roller. To do this, record and play back the E-240 cassette tape.

(5) Perform recording for 60 seconds in the SP mode at the near end of the E-240 cassette tape. Play back the recorded portion and repeat the F. SEARCH ↔ R. SEARCH ten times, following which a check should be made to see if damage is still done to the tape edge.
If a damage in the form of a sawtooth or a streak is still occurred on the tape edge by the upper lounge of entrance side guide roller, proceed with the step given below.

1. Check if a large amount of magnetic particles is adhered to the entrance-side guide roller. If the magnetic particles cannot be removed in spite of repeated cleaning, the guide roller must be replaced with new one.
2. Confirm if the tape is held too tightly by the entrance-side guide roller, or if the first half of the envelope waveform is flat. If the tape is found held too tightly, readjustment should be made by referring to 8-4.
3. Recheck if the damage is still caused on the E-240 tape.
   If the damage is still found on the tape, the entrance-side guide roller should be loosened about 20° counterclockwise.
4. Check once again that no fluctuation is caused in the envelope waveform or the audio waveform by loosening the entrance-side guide roller. To do this, record and play back the E-240 cassette tape.

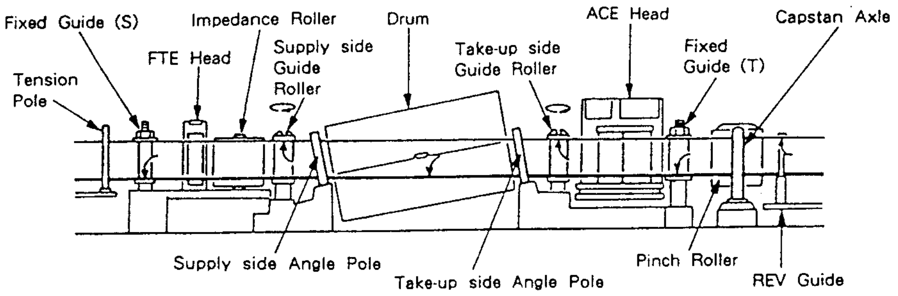
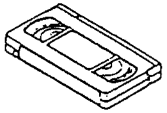


Fig. 7-4-11.

7-5. SERVICE JIGS

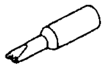
No.	Jig	Jig No.	Remarks
1	Alignment tape (MH-2)	H-7099-052-H	PAL NORMAL
	Alignment tape (VHJ-0009)		EP monoscope, 3kHz (Normal)
2	Eccentric screwdriver (VHJ-0003)	J-6082-044-A	For tape path adjustment
3	Nut box (VHJ-0048)	J-6082-045-A	For tape path adjustment
4	Torque gauge	H-7099-039-H	For reel take-up torque measurement
5	Torque gauge adapter	H-7099-035-H	For reel take-up torque measurement
6	Fixed guide height gauge (VHJ-0053)	J-6082-052-A	For fixed gaude (S) height adjustment
7	Torque gauge screwdriver (VHJ-0014)	J-6082-047-A	For screw fastening torque adjustment
8	3mm dia. bit for torque screwdriver (VHJ-0045)	J-6082-048-A	Spare bit for the torque gauge screwdriver
9	Video head removing tool (VHJ-0041)	J-6082-049-A	For upper drum removal
10	Mode selector (VHJ-0050)	J-6082-050-A	For mechanism mode selection
11	Master plane	H-7099-279-H	Reel table height
12	Reel disc height jig	H-7099-038-H	Reel table height
13	Mode selector relay board (VHJ-0075)	J-6090-008-A	Relay board for mode selector
14	Torque cassette (VHT-063S)	J-6082-011-A	For back tension torque, For REW torque
15	26-pin flexible flat cable (VHJ-0064)	J-6090-006-A	Spare cable for mode selector
16	7-wire flat cable (VHJ-0076)	J-6090-009-A	Spare cable for relay board
17	REV guide lever removing tool (VHJ-0073)	J-6090-007-A	For REV guide lever removal

H-7099-052-H



No. 1

J-6082-044-A (VHJ-0003)



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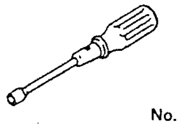

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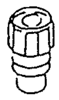
H-7099-039-H



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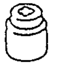
H-7099-035-H



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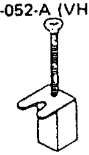

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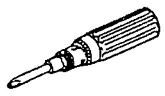
J-6082-047-A (VHJ-0014)



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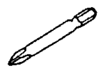
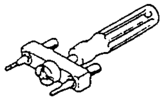
J-6082-048-A (VHJ-0045)



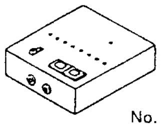
No. 8

J-6082-049-A (VHJ-0041)



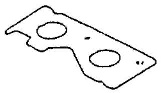
No. 9

J-6082-050-A (VHJ-0050)



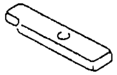
No. 10

H-7099-279-H



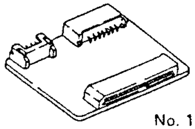
No. 11

H-7099-038-H



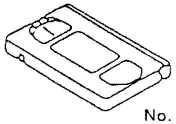
No. 12

J-6090-008-A (VHJ-0075)



No. 13

J-6082-011-A



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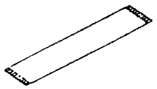
J-6090-006-A (VHJ-0064)



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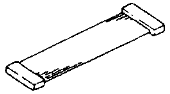
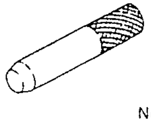
J-6090-009-A (VHJ-0076)



No. 16

J-6090-007-A (VHJ-0073)



No. 17

7-6. MECHANISM MAINTENANCE AND CHECKING

7-6-1. Periodic Checking and Maintenance Item and Service Jigs

The following maintenance and periodic checking procedures are recommended to ensure proper operation, and to protect the tape from dirt and damage. Also these procedures should always be followed after repairing the unit.

(1) PERIODIC CHECK ITEMS

○ Cleaning ◎ Confirmation △ Lubrication □ Exchange

	Usage Time (hours) Part	500H	1000H	1500H	2000H	2500H	3000H	3500H	4000H	4500H	5000H
Tape Path System	ASSY, HOLDER, BAND		◎		□		◎		□		◎
	COMPLE, CYLIDER, 2N4P	○	○	○	○	○	○	○	○	○	○
	ASSY, CYLINDER, UPR, 2N4P	○	◎ (□)	◎ (□)	◎ (□)	◎ (□)	◎ (□)	◎ (□)	◎ (□)	◎ (□)	◎ (□)
	SPECIAL WASHER	○	○	○	○	○	○	○	○	○	○
	TAPE GUIDE	○	○	○	○	○	○	○	○	○	○
	COMPL, BRACKET, HEAD	○	○	○	○	○	□	○	○	○	○
	ASSY, LEVER, REV GUIDE	○	○	○	○	○	○	○	○	○	○
	COMPLE, PINCH POLLER	○	○	○	□	○	○	○	□	○	○
	ASSY, GUIDE, ROLLER	○	○	○	○	○	○	○	○	○	○
	HEAD, FULL ERASE	○	○	○	○	○	□	○	○	○	○
	ROLLER, IMPEDANCE				○△				○△		
	COMPL, LEVER, CLEANER		◎		◎		□		◎		◎
	ASSY, EARTH, CYL.						□				
Reel Drive System	ASSY, REEL, SUPPLY		○		○△		○		○△		○
	ASSY, REEL, TAKE UP		○		○△		○		○△		○
	ASSY, GEAR, ONEWAY		○		○△		○		○△		○
	GEAR, REEL TAKE UP		○		○△		○		○△		○
	COMPLE, IDLER,CLUTCH				△				△		
	ASSY, IDLER		◎		◎		□		◎		◎
	PULLY, REEL				△				△		
	MOTOR, CAPSTAN	○	○	○	○	○	○	○	○	○	□
	BELT, REEL DRIVE				□				□		
	ASSY, GEAR, FRICTION		◎		△□		◎		△□		◎
Brake	ASSY, BRAKE SUB T		◎		◎		◎□		◎		◎
	ASSY, BRAKE, SUPPLY		◎		□		◎		□		◎
	ASSY, BRAKE, TAKE UP		◎		□		◎		□		◎
	ASSY, BRAKE, CAPSTAN		◎		□		◎		□		◎
Loading Drive System	HOLDER, WORM				△				△		
	ASSY, LOADING MOTOR						□				
	BELT, LOADING				□				□		
	GEAR, HELICAL				△				△		
	CAM, MODE				△				△		
	CAM, MAIN				△				△		
Performance Check	FF, REW, REV, PLAY TORQUE		◎		◎		◎		◎		◎
	PLAY B · T TORQUE		◎		◎		◎		◎		◎

Note : The back tension torque is the value that has been measured by the cassette torque meter (VHT-063S). The torque of FF, REV, REW, and PLAY represent those measured with them locked by the torque guage. FF and REW are values 2 seconds after starting.

Torque value :
FWD : 600 gcm or more
REW : 600 gcm or more
PLAY (2H) : 100 to 160 gcm
REV : 210 to 280 gcm
Back tension : 52 ± 13 gcm

(2) CLEANING

1. Drum (COMPL CYLINDER) and Video Heads (See Fig. 7-6-1.)

1) Wrap a chamois leather around your finger and moisten it with methyl alcohol.
2) Move the chamois leather to left and right several times on the video head to clean. There is a video head also on the opposite side, so clean it likewise. In this models, clean the audio head also.
3) Clean the tape path surface of the cylinder in the same way.

Note: Always turn power off before cleaning. Never move the chamois leather vertically or apply too much force to the head ; it may be damaged.

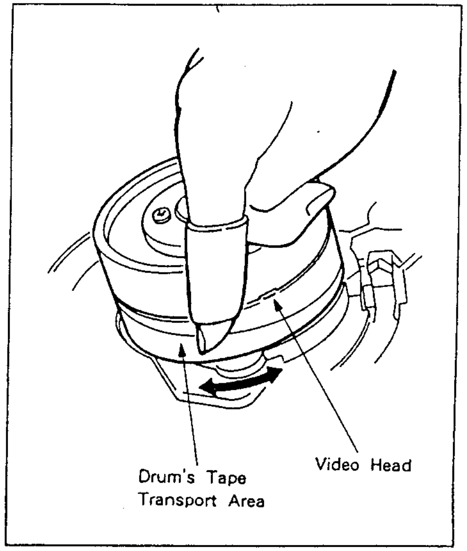


Fig. 7-6-1.

2. Cleaning of the Tape Guide System (See Fig. 7-6-2.)

Set the EJECT mode and clean the tape guide system (tape guides, impedance roller, FTE head, ACE head, pinch rollers, capstan axles, etc.) with a chamois leather moistened with methyl alcohol.

Note: Make sure that no oil, grease, etc. adhere to the chamois leather and that heads are not damaged.

3. Cleaning of the Drive System

Clean the drive system (loading belt, reel drive belt, pulley, supply reel table, etc.) with a soft cloth moistened with methyl alcohol.

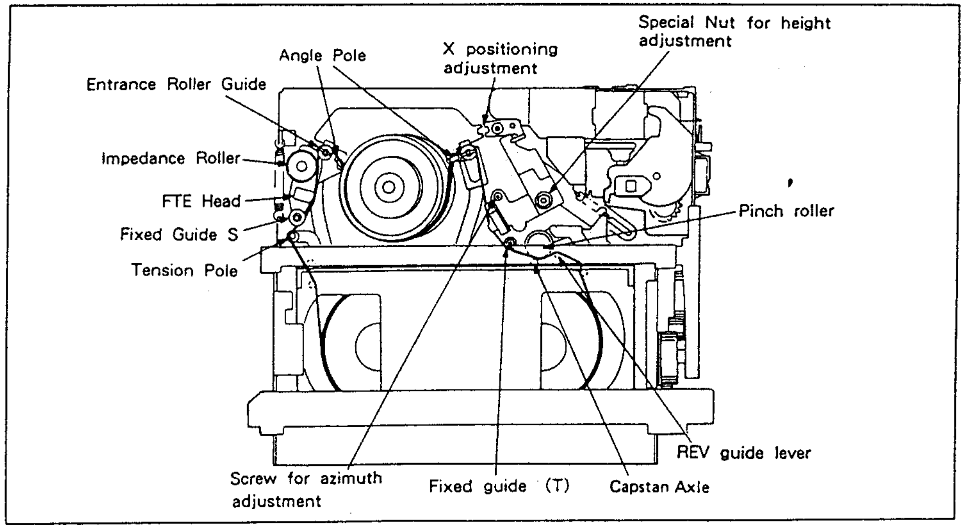


Fig. 7-6-2. Cleaning

7-6-2. Mode Selector (VHJ-0050) Handling Instructions

The mode selector drives the loading motor of the P91 mechanism with its internal batteries (UM-2 × 4 = 6V), using LEDS to indicate the mode (EJECT, INITIAL, BRAKE, STOP/REW/FWD, STILL, PLAY, IDLER, REV) simultaneously with EJECT⇔REV mode changes.
Instead of the internal batteries, an external DC 6V power supply can also be used.

(1) PART NAMES (See Fig. 7-6-3).

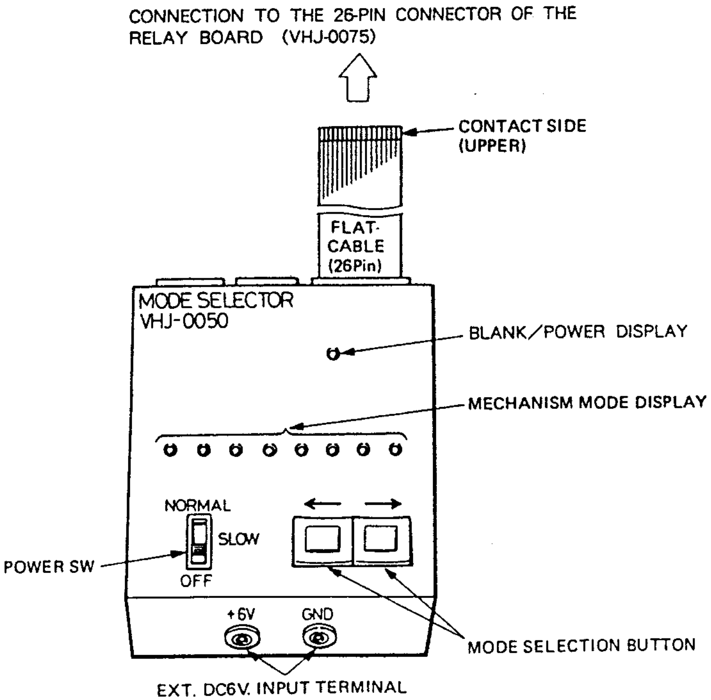

CONNECTION TO THE 26-PIN CONNECTOR OF THE RELAY BOARD (VHJ-0075)
CONTACT SIDE (UPPER)
FLAT-CABLE (26Pin)
MODE SELECTOR VHJ-0050
BLANK/POWER DISPLAY
MECHANISM MODE DISPLAY
NORMAL
SLOW
OFF
POWER SW
+6V
GND
MODE SELECTION BUTTON
EXT. DC6V. INPUT TERMINAL

Fig. 7-6-3.

(2) CONNECTION METHOD

1. Connection for model VH-90 (See Fig. 7-6-4.)

1) Remove the 7-wire cable connected from the system control circuit to the connector (CN822) of the MC-3 board.
2) Connect the 7-wire cable (VHJ-0076) between the connector (CN822) of the MC-3 board and the 7-pin connector of the Mode Selector Connection Board (VHJ-0075).
3) Remove the 6-wire cable extending from the cassette holder section from the connector of the System Control Circuit Board and connect it to the 6-pin connector of the Mode Selector Connection Board (VHJ-0075).
4) Connect a supplied 26-pin flat cable (VHJ-0064) of the mode selector (VHJ-0050) between the mode selector body and the 26-pin connector of the Connection Board (VHJ-0075).

Note: Care should be taken to avoid mistaking the direction of the contacting side when connecting a flexible flat cable.

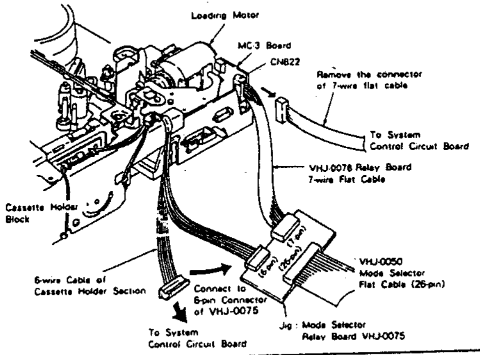

Loading Motor
MC-3 Board
CN822
Remove the connector of 7-wire flat cable
To System Control Circuit Board
VHJ-0076 Relay Board 7-wire Flat Cable
Cassette Holder Block
(7-pin)
(26-pin)
(6-pin)
VHJ-0050 Mode Selector Flat Cable (26-pin)
6-wire Cable of Cassette Holder Section
Connect to 6-pin Connector of VHJ-0075
To System Control Circuit Board
Jig : Mode Selector Relay Board VHJ-0075

Fig. 7-6-4. Connection

(3) HANDLING METHOD

1) The mode changes in sequence of EJECT, INITIAL, BRAKE, STOP/REW/FF, STILL, PLAY, IDLER, REV when the right side (⇨) of the mode selector button is kept on pressing.
2) To change the mode from REV to EJECT, press the left side (⇨) of the mode selector button to select the desired mode.
3) In the mid position of each mode during a shift to other mode, the "BLANK" LED lights. But the "PLAY", "IDLER", "REV" LEDs light between the EJECT mode and the INITIAL mode. Be sure therefore to check the mechanism body to see just what state the mechanism is in.
Incidentally, if the mode selector is not connected to the mechanism, the "BLANK" LED lights to indicate the power ON.
4) The SLOW position of POWER switch makes relatively slow motions in comparison with the NORMAL position.

Note 1: The mode selector drives the loading motor only, not affecting the head drum motor and the capstan motor. When using the mode selector with a cassette loaded, turn the capstan motor manually to remove tape slackness, preventing tape entanglement.

Note 2: If the Left side (⇦) of the mode selector (VHJ-0050) key is kept pressed with the COMPL cassette mechanism removed, it might get past the EJECT position, causing the front helical gear and the front worm gear to get disengaged.

In this condition, since the front helical gear will not turn even if the right side (⇨) of the mode selector key is pressed, rotate (push) the front helical gear clockwise by hand and engage it with the front worm gear. As there is a misalignment between the mechanism main body operation mode (indicated by the mode selector indicator lamps) and the front loading mechanism operation mode, keep the right side (⇨) of the mode selector key pressed until the front helical gear and the front loading gear of the front loading mechanism get back to the initial condition. (See A and B in Fig. 7-7-9. of page 29. Loading Motor.)

When the front loading mechanism returns to the initial condition, operation mode of the whole mechanism gets back to normal, matching the mode shown by the mode indicator lamps (mode EJECT would not be properly indicated during eject).

Sometimes, engagement of the front helical gear with the front worm gear is delayed and operation mode. The mechanism main body gets too much ahead and the front loading mechanism mode cannot be switched to the initial condition. In that case, press the Left side (⇦) of the mode selector key, setting the mechanism main body operation mode back to EJECT (rotation of the mode cam and the MAIN CAM stops).

Note 3: The mode indicator lamps show the mechanism operation mode, but the EJECT lamp may sometimes fail to indicate the actual mechanism operation mode.

When setting the mechanism to the EJECT or INITIAL mode for dismounting or reassembling, fine adjustment of the each gear and cam, etc., marking positions is required after the mode indicator lamp has lighted up. Perform this with the mode selector switch in the SLOW position.

7-7. MECHANISM DISMANTLING AND REASSEMBLING

7-7-1. Mechanism Main Unit (See Fig. 7-7-1.)

1. Removal

1) Remove the connectors of the COMPL MC-3 and the COMPL HEAD BRACKET.
2) Remove the flexible cable ① connecting the COMPL CYLINDER to the PRE-AMP UNIT ③. (See Fig. A.)
3) Remove the two screws ②, then remove the PRE-AMP UNIT ③.
4) Remove the two screws ④, then remove the PRE-AMP BRACKET ⑤.
5) Remove the two screws ⑥.
6) Remove the three screws ⑦ and two screws ⑩, then lift up the mechanism main unit and remove it.
Since the TRAY ⑧ obstructs removal of the two front screws ⑩, move the TRAY LOCK LEVER ⑨ in the direction of the arrow to unlock, then slide the TRAY ⑧ before removing the screws. (See Fig. B)

Note: Shape of the PRE-AMP UNIT ③ and the PRE-AMP BRACKET ⑤ differ depending on the model.

2. Remounting

1) Mount the mechanism main unit onto the chassis with the three screws ⑦ and two screws ⑩.
2) Tighten the two screws ⑥.
3) Mount the PRE-AMP BRACKET ⑤ with the two screws ④.
4) Mount the PRE-AMP UNIT ③ and the ground lug with the two screws ②. (some models are not provided with a ground lug.)
5) Insert the flexible cable ① into the connector of the PRE-AMP UNIT.
6) Connect the connectors of the COMPL MC-3 and COMPL HEAD BRACKET.

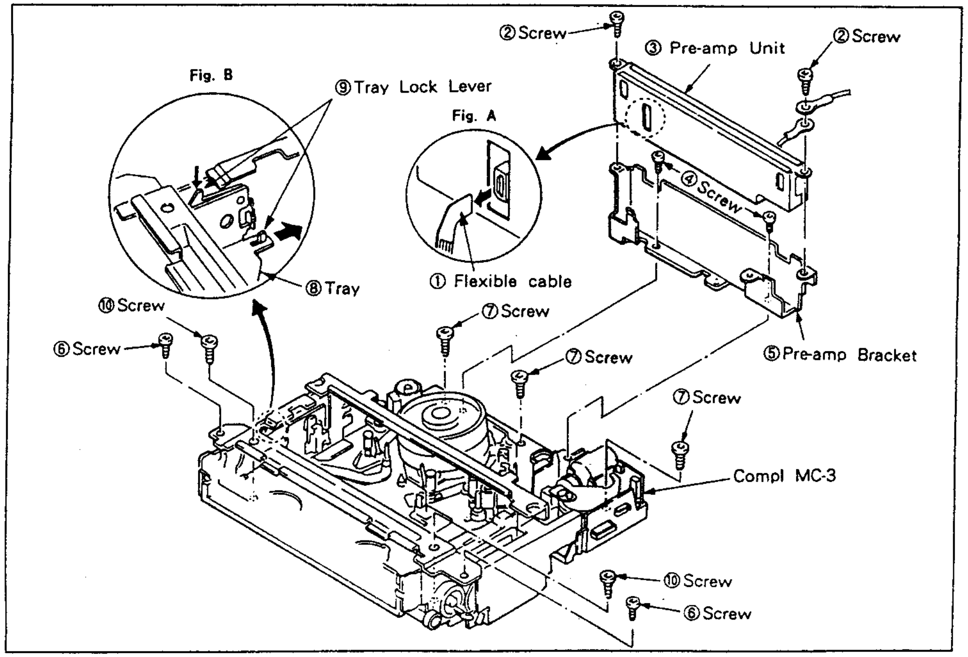


Fig. 7-7-1. Mechanism Main Unit

7-7-2. Cassette Mechanism Assembly

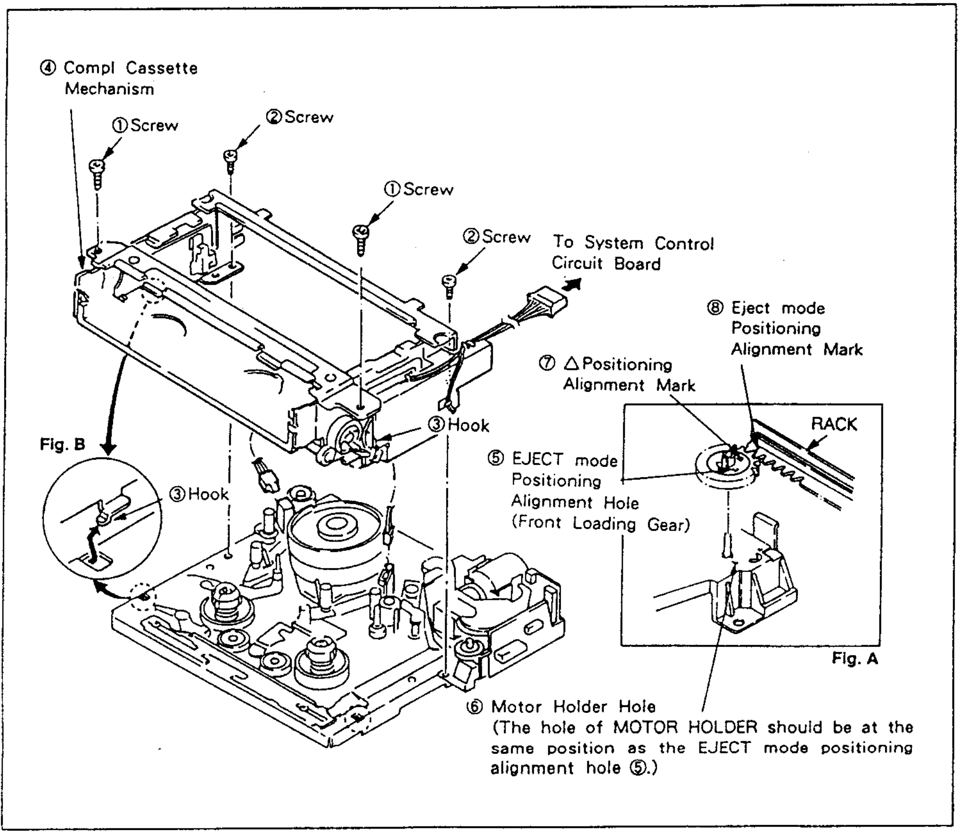
(1) COMPL CASSETTE MECHANISM
(See Fig. 7-7-2.)

1. Removal

1) Set the video main unit to the EJECT completed mode.
2) Pull out the connectors (6-PIN CONNECTOR connected to the system control circuit board, ACE HEAD CONNECTOR, and FTE HEAD CONNECTOR) from CASSETTE HOLDER.
3) Remove the two screws ①.
4) Remove the two screws ②.
5) Lift up the COMPL CASSETTE MECHANISM ④ back a little and remove the two hooks ③ on the front. (See Fig. B.) When doing so, make sure that the SAFETY SWITCH LEVER is not caught by the mechanism chassis.

2. Remounting

1) Set the chassis section mechanism to the EJECT mode with the mode selector (VHJ-0050) (looking from the top, align the EJECT mode positioning alignment hole ⑤ to the MOTOR HOLDER hole ⑥ as shown in Fig. A).
2) Set the COMPL CASSETTE MECHANISM ④ to the EJECT completed mode.
3) Mount the COMPL CASSETTE MECHANISM ④ onto the mechanism chassis, aligning it with the protuberance.
   Align the EJECT mode positioning alignment mark ⑧ to the △ positioning alignment mark ⑦. (See Fig. A)
4) Fix to the mechanism chassis with the two screws ②.
5) Fix to the chassis with the two screws ①.
6) Connect to the various connectors.


④ Compl Cassette Mechanism
①Screw
②Screw
①Screw
②Screw
To System Control Circuit Board
⑧ Eject mode Positioning Alignment Mark
⑦ △Positioning Alignment Mark
RACK
③Hook
⑤ EJECT mode Positioning Alignment Hole (Front Loading Gear)
Fig. B
③Hook
Fig. A
⑥ Motor Holder Hole

(The hole of MOTOR HOLDER should be at the same position as the EJECT mode positioning alignment hole ⑤.)

Fig. 7-7-2. COMPL Cassette Mechanism

(2) GEAR BRACKET ASS'Y (See Fig. 7-7-3.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 7-7-2.
2) Remove the four screws ①, then remove the GEAR BRACKET ASS'Y ② as shown in Fig. A.
3) Remove the E ring ③, then remove the LOCK GEAR ④, the PINION LEVER ASS'Y ⑤, the PINION GEAR ⑥ and the RACK ⑦, in that order.

2. Remounting

1) Apply grease to the shaft ⑧ and the two pins ⑨ of the GEAR BRACKET ASS'Y.
2) Apply grease to the pin ⑩ of the PINION LEVER ASS'Y.
3) Apply grease to the toothed part of the RACK ⑦.
4) Fit the RACK ⑦ onto the two pins ⑨. Align the positioning alignment hole ⑪ to the positioning alignment hole ⑫ of the GEAR BRACKET.
5) Mount the PINION GEAR ⑥, PINION LEVER ASS'Y ⑤, and LOCK GEAR ④ in the shaft ⑧ in the order mentioned.
   Align the positioning alignment holes ⑬ of PINION GEAR and LOCK GEAR with the positioning alignment hole ⑪ of RACK at that time.
6) Mount the E ring ③ onto the shaft ⑧.
7) Set the GEAR BRACKET ASS'Y ② to the dowel and mount it using four screws ①.
   Align the positioning alignment hole Ⓐ of the IDLER GEAR with the positioning alignment hole Ⓑ of the SIDE BOARD as shown in Fig. 7-7-4. at this time.
   Also align the positioning alignment holes ⑬ of PINION GEAR and LOCK GEAR with the positioning alignment hole ⑫ of GEAR BRACKET by referring to Fig. 7-7-3. After mounting them, check to be sure that FL START SWITCH ⑭ is in the ON state shown in Fig. A.
8) Remount the COMPL CASSETTE MECHANISM as instructed in P.22.

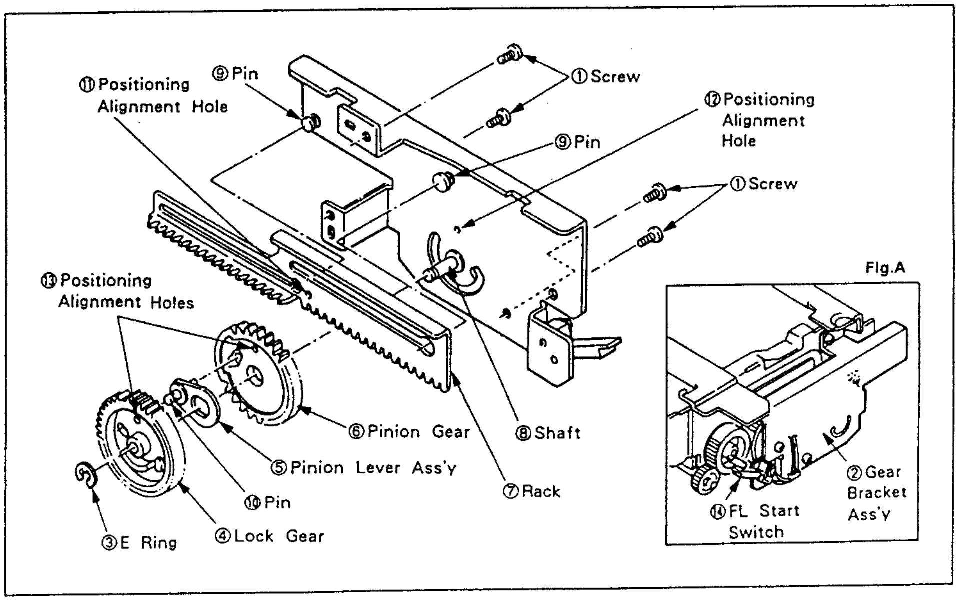

⑪Positioning Alignment Hole
⑨Pin
①Screw
⑫Positioning Alignment Hole
⑨Pin
①Screw
⑬Positioning Alignment Holes
Fig.A
⑥Pinion Gear
⑧Shaft
⑤Pinion Lever Ass'y
⑦Rack
⑩Pin
③E Ring
④Lock Gear
②Gear Bracket Ass'y
⑭FL Start Switch

Fig. 7-7-3. Gear Bracket Ass'y

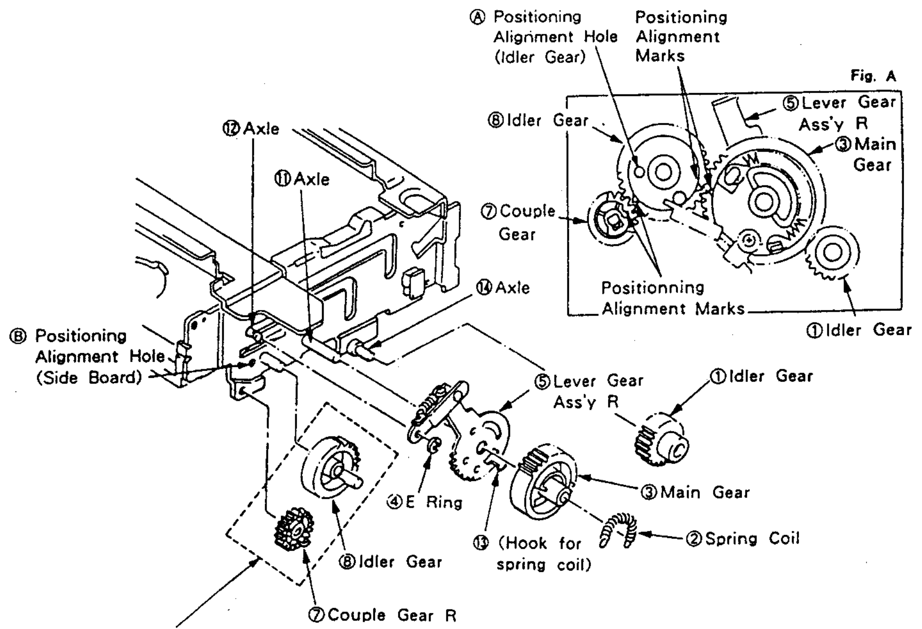
(3) CASSETTE DRIVE GEAR (RIGHT)
(See Fig. 7-7-4.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM and the GEAR BRACKET ASS'Y as instructed in P.23. and P.24., respectively.
2) Remove the IDLER GEAR ①.
3) Remove the SPRING COIL ②, then remove the MAIN GEAR ③.
4) Remove the E ring ④, then remove the LEVER GEAR ASS'Y R ⑤.

2. Remounting

1) Apply grease to gear parts that undergo friction.
2) Align the positioning alignment hole Ⓐ of IDLER GEAR ⑧ with the positioning alignment hole Ⓑ of SIDE BOARD.
3) Mount the LEVER GEAR ASS'Y R ⑤ onto the axles ⑪ and ⑫. Align with the IDLER GEAR ⑧ as shown in Fig. A.
4) Mount the E ring ④ onto the axle ⑫.
5) Mount the MAIN GEAR ③ onto the axle ⑪. When doing so, align with the IDLER GEAR ⑧ as shown in Fig. A.
6) Hook the SPRING COIL ② to the notch ⑬ in the MAIN GEAR ③ and the LEVER GEAR ASS'Y R.
7) Mount the IDLER GEAR ① onto the axle ⑭. When doing so, align with the MAIN GEAR as shown in Fig. A.
8) Mount the GEAR BRACKET ASS'Y and the COMPL CASSETTE MECHANISM as instructed in P.24. and P.23., respectively.


Ⓐ Positioning Alignment Hole (Idler Gear)
Positioning Alignment Marks
Fig. A
⑤Lever Gear Ass'y R
⑧Idler Gear
③Main Gear
⑦Couple Gear
⑭Axle
Positionning Alignment Marks
①Idler Gear
⑫Axle
⑪Axle
Ⓑ Positioning Alignment Hole (Side Board)
⑤Lever Gear Ass'y R
①Idler Gear
④E Ring
③Main Gear
⑬ (Hook for spring coil)
②Spring Coil
⑧Idler Gear
⑦Couple Gear R

Do not remove the couple gear ⑦ and idler gear ⑧.

Fig. 7-7-4. Cassette Drive Gears (Right Side)

(4) CASSETTE DRIVE GEAR (LIFT)
(See Fig. 7-7-5.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in P.22.
2) Remove the E ring ②.
3) Open the hook ③, then remove the LEVER GEAR ASS'Y L ④. Take care not to open the hook ③ too much, otherwise it may get deformed or broken. If it does, replace it.
4) Remove the SPRING COIL ⑤ from the LEVER GEAR ASS'Y L ④.

2. Remounting

1) Apply grease to the axle ⑨ and shaft ⑩.
2) Align with the COUPLE GEAR L ⑬ and the IDLER GEAR L ⑥ as shown in Fig B.
3) Hook the SPRING COIL ⑤ to the LEVER GEAR ASS'Y L ④.
4) Mount the LEVER GEAR ASS'Y L ④ onto the axle ⑨ and the shaft ⑩. Align with the IDLER GEAR L ⑥ as shown in Fig. B.
5) Mount the COMPL CASSETTE MECHANISM onto the chassis as instructed in P.22.

Note: The end of the DOOR OPEN LEVER ⑦ leans against the front side of the CASSETTE DOOR ⑪ as shown in Fig. A.

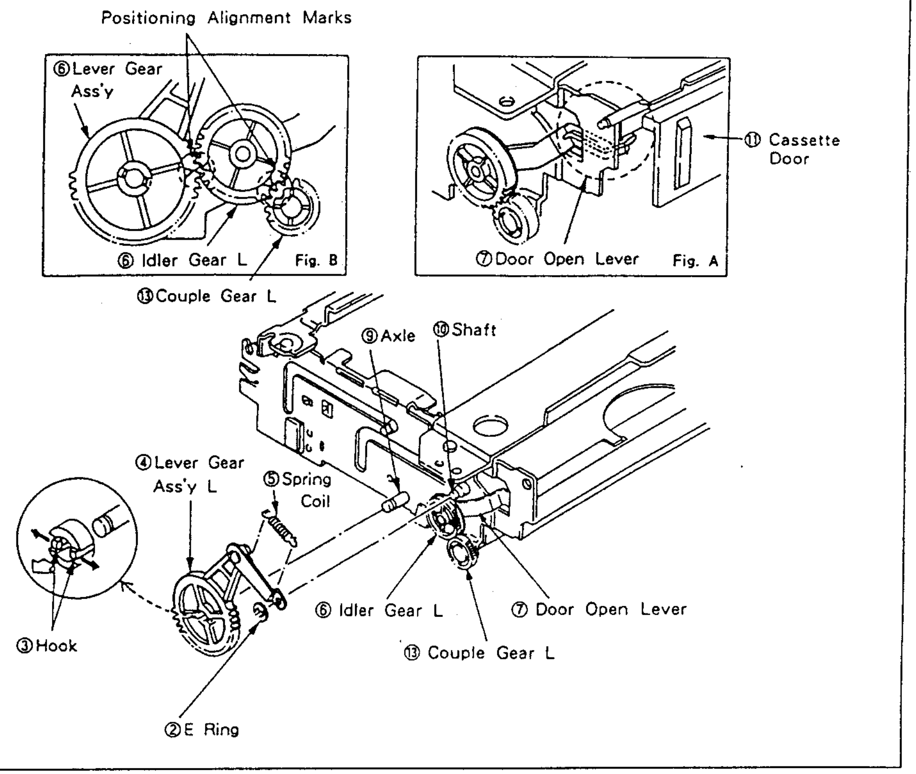

Positioning Alignment Marks
⑥Lever Gear Ass'y
⑥ Idler Gear L
Fig. B
⑬Couple Gear L
⑪ Cassette Door
⑦Door Open Lever
Fig. A
⑨Axle
⑩Shaft
④Lever Gear Ass'y L
⑤Spring Coil
③Hook
⑥ Idler Gear L
⑦ Door Open Lever
⑬ Couple Gear L
②E Ring

Fig. 7-7-5. Cassette Drive Gears (Left Side)

(5) FL START SWITCH (See Fig. 7-7-6.)

1. Removal
1) Remove the COMPL CASSETTE MECHANISM as instructed in P.22.
2) Remove the screw ①.
3) Remove the lead wire of the FL START SWITCH ②.

2. Remounting
1) Solder the lead wire to the FL START SWITCH ② terminal.
2) Align the FL START SWITCH ② protuberance to the hole ⑤, then mount it onto the GEAR BRACKET ASS'Y ③ with the screw ①. Do it so that the FL START SWITCH ② is turned ON by holding the pin ④ of IDLER GEAR in the EJECT completed mode.
3) Mount the COMPL CASSETTE MECHANISM as instructed in P.22.

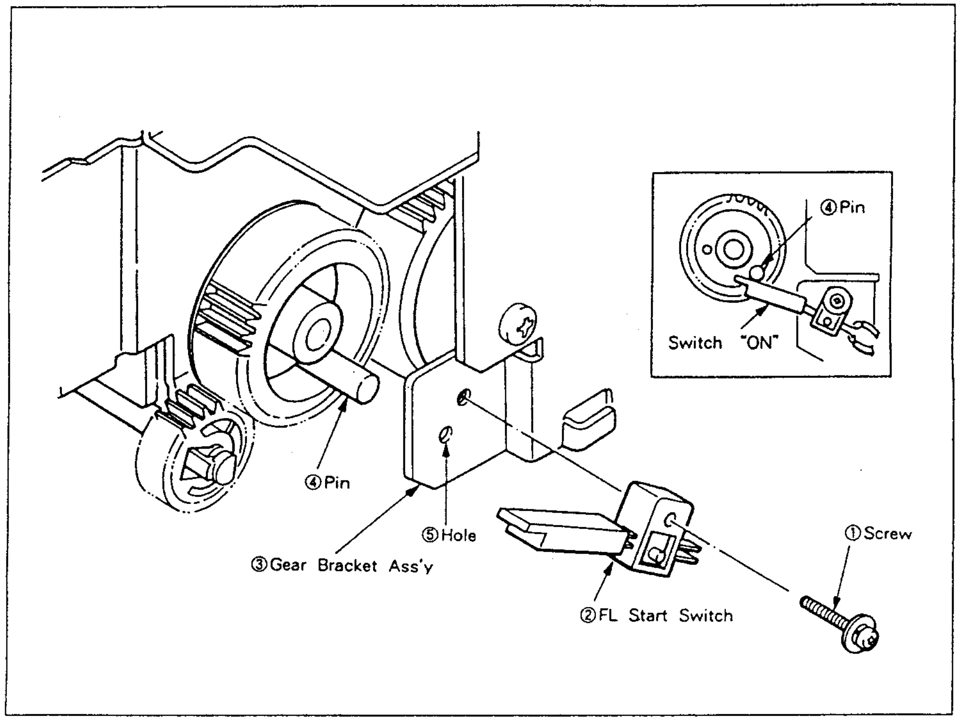

④Pin
Switch "ON"
④Pin
⑤Hole
③Gear Bracket Ass'y
②FL Start Switch
①Screw

Fig. 7-7-6. FL Start Switch

(6) T-TOP SENSOR, T-END SENSOR (See Fig. 7-7-7.)

1. Removal
1) Remove the COMPL CASSETTE MECHANISM as instructed in P.22.
2) When removing the T-TOP SENSOR, remove the GEAR BRACKET ASS'Y as instructed in P.23.
3) Unhook the hook ① as instructed in Fig. A, then remove the LID ②. Take care not to push the hook ① too much, otherwise it may be deformed or broken.
4) Remove the photo transistors ③, then remove the lead wires.

Note: Mounting position of the transistor holder on the T-END SENSOR side is precisely adjusted at the factory, so never remove it from the COMPL CASSETTE MECHANISM.

2. Remounting
1) Solder the brown lead wire to the emitter side, and the red lead wire to the collector side of the T-TOP SENSOR photo transistor ③.
Solder the orange lead wire to the emitter side, and the yellow lead wire to the collector side of the T-END SENSOR photo transistor.
2) Mount the photo transistors ③ onto their respective holders.
3) Mount the LID ② and fix it with the hook ①.
4) Mount the GEAR BRACKET ASS'Y as instructed in P.23.
5) Mount the COMPL CASSETTE MECHANISM as instructed in P.22.

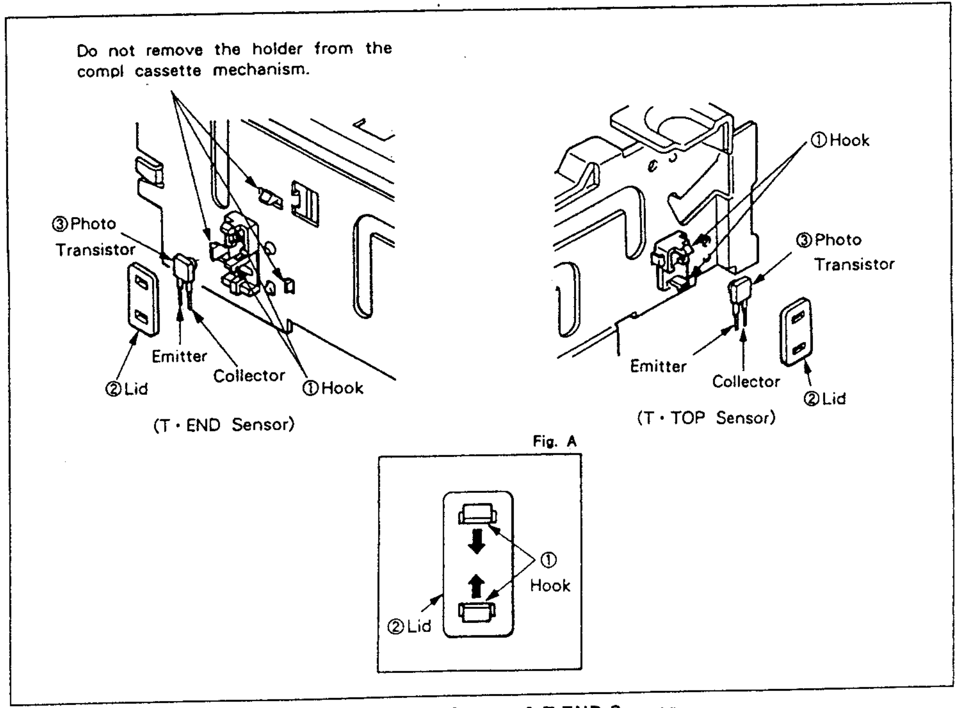

Do not remove the holder from the compl cassette mechanism.
③Photo Transistor
Emitter
Collector
②Lid
①Hook
(T・END Sensor)
①Hook
③Photo Transistor
Emitter
Collector
②Lid
(T・TOP Sensor)
Fig. A
①
Hook
②Lid

Fig. 7-7-7. T TOP Sensor & T END Sensor

7-7-3. COMPL Holder Motor (Loading Motor Block)

(1) COMPL Motor Bracket

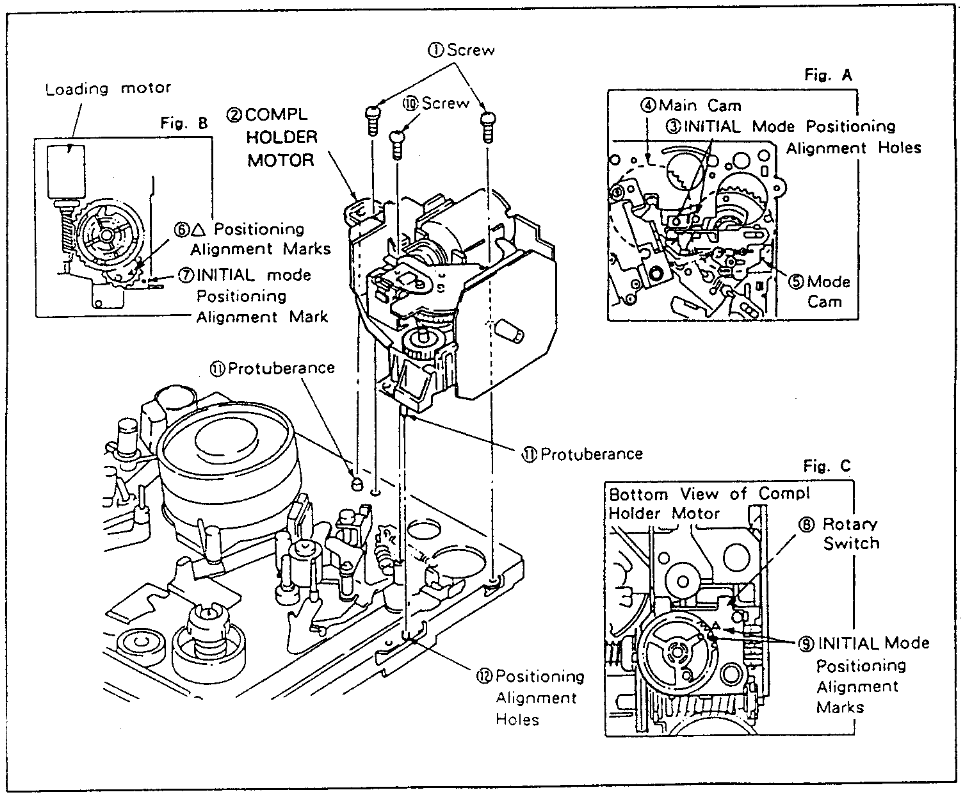
1. Removal

1) Remove the PRE-AMP UNIT and the PRE-AMP. BRACKET as instructed in 7-7-1.
2) Remove the COMPL CASSETTE MECHANISM as instructed in P.22.
3) Remove the two screws ① and the other one ⑩, then remove the COMPL HOLDER MOTOR ② (See Fig. 7-7-8.)

2. Remounting

1) Set the mechanism chassis to the INITIAL mode. In this mode, look at the mechanism chassis INITIAL mode positioning alignment holes ③ just from above and align the MAIN CAM ④ and MODE CAM ⑤ INITIAL mode positioning alignment holes as shown in Fig. A.
2) Set the COMPL HOLDER MOTOR ② to the INITIAIL mode with the mode selector (VHJ-0050). In this position, the FRONT LOADING GEAR △ positioning alignment mark ⑥ is aligned with the MOTOR HOLDER INITAL mode positioning alignment mark ⑦ (see Fig. B.).
3) Align the ROTARY SWITCH (mode detector switch) ⑧ with the INITIAL mode positioning alignment mark ⑨ (see Fig. C.).
4) Line up COMPL HOLDER MOTOR ② with PROTUBERANCE ⑪ and POSITIONING ALIGNMENT HOLE ⑫, and attach with two screws ① and one screw. (See Fig. 7-7-8.)
5) Mount the COMPL CASSETTE MECHANISM as instructed in P.22.
6) Mount the PRE-AMP UNIT and the PRE-AMP. BRACKET as instructed in 7-7-1.

Note: Normal mechanism operation cannot be achieved if initial positioning of the MAIN CAM ④, the MODE CAM ⑤ and the ROTARY SWITCH (mode detector switch) ⑧ are not performed precisely.



①Screw
Loading motor
Fig. B
②COMPL HOLDER MOTOR
⑩Screw
⑥△ Positioning Alignment Marks
⑦INITIAL mode Positioning Alignment Mark
⑪Protuberance
⑪Protuberance
⑫Positioning Alignment Holes
Fig. A
④Main Cam
③INITIAL Mode Positioning Alignment Holes
⑤Mode Cam
Fig. C
Bottom View of Compl Holder Motor
⑧ Rotary Switch
⑨INITIAL Mode Positioning Alignment Marks

Fig. 7-7-8. Compl Holder Motor

(2) LOADING MOTOR (See to Fig. 7-7-9)

1. Removal

LOADING MOTOR can be replaced after LOADING MOTOR BLOCK unit has been removed by referring to 7-7-8. The 1991 version of the mechanism allows LOADING MOTOR itself to be replaced without removing CASSETTE HOLDER BLOCK and LOADING MOTOR BLOCK. The following describes this procedure.

1) Use MODE SELECTOR (VHJ-0050) to set the mechanism to the INITIAL mode.
2) Remove the connector for DEW SENSOR connected to the MC-3 board ①.
3) Remove the three screws ② and remove the HOLDER BRACKET ④ with the FRONT WORM ASS'Y ③ still attached.
4) Remove the DAMPER ⑥ attached to the pulley of the LOADING MOTOR ⑤.
5) Remove the FRONT HELICAL GEAR ⑦ and WASHER ⑧.
6) Remove soldered LEAD WIRE from the terminal of LOADING MOTOR ⑤.
7) Remove the LOADING BELT ⑨.
8) Remove the LOADING MOTOR ⑤ by lifting up from the back terminal side.

2. Remounting

Before attaching the LOADING MOTOR ⑤ to the MOTOR HOLDER ⑩, confirm the DAMPER ⑪ and DAMPER ⑫ shown in Fig. 7-7-9. are in the proper position on MOTOR HOLDER ⑩.

1) The LOADING MOTOR ⑤ puts PROTUBERANCE ㉓ in the slit ㉔ of the MOTOR HOLDER ⑩. Further, mount the tap hole ⑬ at two points of the front pulley side so that the it is secured to the PROTUBERANCE ⑭ of the MOTOR HOLDER at two points.
2) Solder the lead wire from the MC-3 board to the LOADING MOTOR ⑤ terminal. (Solder the red lead wire to the positive terminal side.)
3) Hang the LOADING BELT ⑨ on the pulley.
4) After hanging the LOADING BELT ⑨ on the pulley, confirm that the mechanism unit is in the INITIAL mode. The initial mode is indicated by Fig. A of Fig. 7-7-9. , and is the position in which INITIAL mode positioning alignment holes of the MAIN CAM ⑮ and MODE CAM ⑯ are lined up with the THROUGH HOLE ⑰ of the MOTOR HOLDER. If the INITIAL mode is not selected, adjust with MODE SELECTOR (VHJ-0050).
5) As shown in Fig. B, confirm the positions of the △ INITIAL positioning alignment mark on the FRONT LOAD GEAR ⑱ and INITIAL mode positioning alignment mark ⑲ position of the MOTOR HOLDER and the position relationship of the RACK ⑳.
6) Apply a light coat of grease to the entire sides of the AXLE ㉑ and FRONT HELICAL GEAR ⑦.
7) Attach the FRONT HELICAL GEAR ⑦ and WASHER ⑧ to the AXLE ㉑. As shown in Fig. C, the FRONT HELICAL GEAR ⑦ is attached so that the indent on the side is inside PIN ㉒ of the FRONT LEVER ASS'Y.
8) Attach the DAMPER ⑥ to the LOADING MOTOR ⑤ pulley.
9) The HOLDER BRACKET ④ is attached by engaging the FRONT WORM ASS'Y ③ with the LOADING MOTOR ⑤ pulley, and held in place with three screws ②.
10) Attach the connector of DEW SENSOR ㉕ to the MC-3 board ① and return the mechanism to the eject completion using MODE SELECTOR.

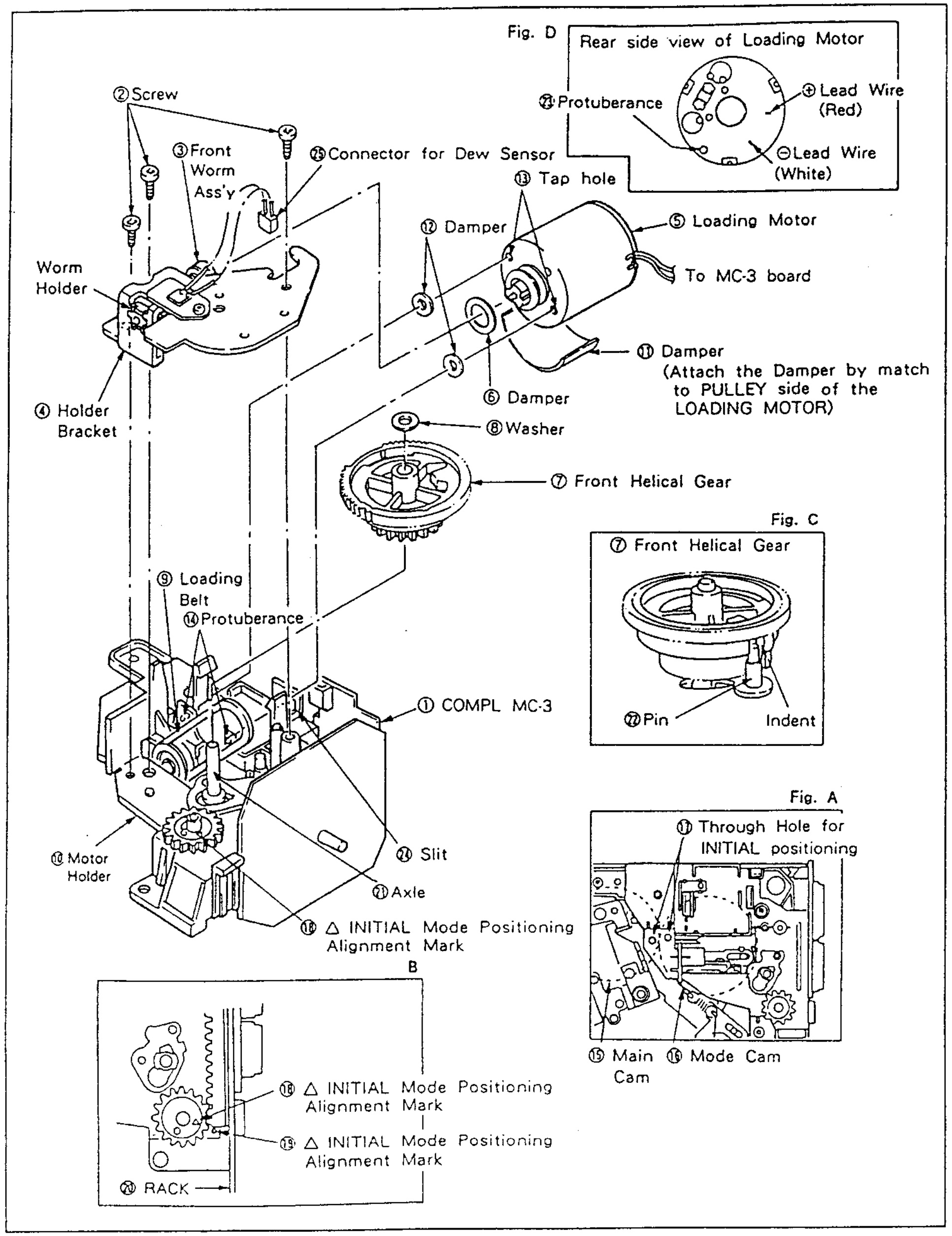


Fig. D
Rear side view of Loading Motor
㉑ Protuberance
⊕ Lead Wire (Red)
⊖ Lead Wire (White)
② Screw
③ Front Worm Ass'y
㉕ Connector for Dew Sensor
⑬ Tap hole
⑫ Damper
⑤ Loading Motor
To MC-3 board
Worm Holder
⑪ Damper
(Attach the Damper by match to PULLEY side of the LOADING MOTOR)
④ Holder Bracket
⑥ Damper
⑧ Washer
⑦ Front Helical Gear
Fig. C
⑦ Front Helical Gear
㉒ Pin
Indent
⑨ Loading Belt
⑭ Protuberance
① COMPL MC-3
Fig. A
⑪ Through Hole for INITIAL positioning
⑩ Motor Holder
㉔ Slit
㉑ Axle
⑱ △ INITIAL Mode Positioning Alignment Mark
B
⑱ △ INITIAL Mode Positioning Alignment Mark
⑲ △ INITIAL Mode Positioning Alignment Mark
⑳ RACK
⑮ Main Cam
⑯ Mode Cam

Fig. 7-7-9. Loading Motor

7-7-4. Tape Loading Mechanism

(1) MAIN PARTS OF THE TAPE LOADING MECHANISM (See Fig. 7-7-10)

1. Removal

1) Remove connectors from the DRUM MOTOR board (SV-5).
2) Remove the three screws ①, then remove the REINFORCE BRACKET ②.
3) Remove the two special washers ③, then remove the LOAD RACK ④.
4) Remove the special washer ⑤, then remove the CAM LOAD LEVER ASS'Y ⑥.
5) Remove the special washer ⑦, then remove the MAIN CAM ⑧.
6) Unhook the LOAD GEAR T hook ⑩, then remove the LOAD GEAR T ⑨ as shown in Fig. A, with the SPRING COIL ⑪ and the LOAD LEVER ASS'Y T ⑫ attached to it.
7) Unhook the LOAD GEAR S hook ⑭, then remove the LOAD GEAR S ⑬ as shown in Fig. B, with the SPRING COIL ⑮ and the LOAD LEVER ASS'Y S ⑯ attached to it.

Note: Take care not to open the LOAD GEAR hooks too much, otherwise they may be deformed or broken. If they are, replace them.

2. Remounting

1) Apply grease to the hole ⑰ of the LOAD LEVER ASS'Y S ⑯, as shown in Fig. B.
2) Apply grease to the hole ㉒ of the LOAD LEVER ASS'Y T ⑫ as shown in Fig. A, and to the sections of the LOAD GEAR T ⑨ as indicated with an arrow in Fig. C.
3) Apply grease to GROOVE 1, GROOVE 2 and to the outer side of the MAIN CAM ⑧, shown in Fig. E.
4) Apply grease to the three oval holes of the LOAD RACK ④ as shown in Fig. D.
5) Apply grease to the outer surface of axles ⑲, ⑳, ㉖ and ㉘.
6) After assembling as shown in Fig. B, mount the LOAD GEAR S ⑬ onto the axle ⑲. Insert the ROLLER BASE S pin ⑱ into the hole ⑰ of the LOAD LEVER ASS'Y S.
7) After assembling as shown in Fig. A, mount the LOAD GEAR T ⑨ onto the axle ⑳. When doing so, align the INITIAL mode positioning alignment holes ㉑ of the LOAD GEAR S ⑬ and the LOAD GEAR T ⑨ to the INITIAL mode position. Insert the ROLLER BASE T pin ㉓ into the hole ㉒ of the LOAD LEVER ASS'Y T ⑫.
8) Mount the MAIN CAM ⑧ onto the axle ㉖. At that time, make sure that the INITIAL mode positioning alignment holes ㉕ of the MAIN CAM ⑧ and the MODE CAM ㉔ match the INITIAL mode positioning alignment holes ㉞ of the MECHANISM CHASSIS. Also check to be sure that the pin ㉗ of the CAM PINCH LEVER ASS'Y is put in the GROOVE 1 of the MAIN CAM as shown in Fig. E.
9) Mount the special washer ⑦ onto the axle ㉖.
10) Mount the CAM LOAD LEVER ASS'Y ⑥ onto the axle ㉘. Insert the pin ㉙ into the MAIN CAM GROOVE 2 as shown in Fig. E.
11) Mount the special washer ⑤ onto the axle ㉘.
12) Set the INITIAL mode positioning alignment marks ㉚ of the LOAD RACK ④ and the LOAD GEAR T ⑨ to the INITIAL mode position, and mount onto the two axles ㉛. Insert the CAM LOAD LEVER ASS'Y pin ㉝ into the hole ㉜.
13) Mount the two special washers ③ onto the two axles ㉛.
14) Mount the REINFORCE BRACKET ② with the three screws ①.
15) Insert the connector into the DRUM MOTOR board (SV-5).
16) Confirm that loading and unloading are performed smoothly.

Note: Be sure to perform INITIAL mode positioning of cams and gears precisely.

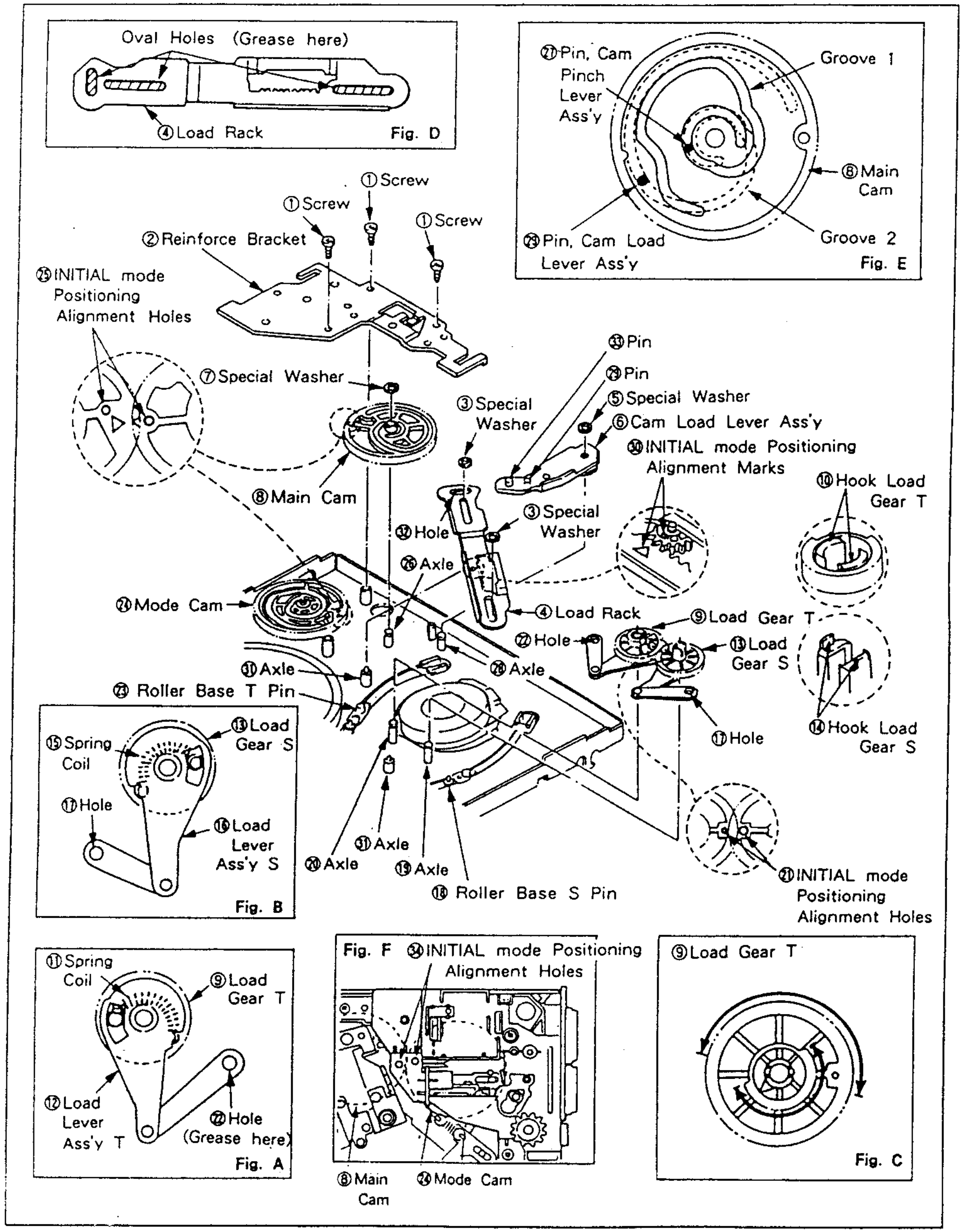

Oval Holes (Grease here)
④Load Rack
Fig. D
㉑Pin, Cam Pinch Lever Ass'y
Groove 1
⑧Main Cam
㉙Pin, Cam Load Lever Ass'y
Groove 2
Fig. E
①Screw
①Screw
①Screw
②Reinforce Bracket
㉕INITIAL mode Positioning Alignment Holes
⑦Special Washer
⑧Main Cam
③Special Washer
㉝Pin
㉙Pin
⑤Special Washer
⑥Cam Load Lever Ass'y
㉚INITIAL mode Positioning Alignment Marks
⑩Hook Load Gear T
③Special Washer
㉜Hole
㉖Axle
㉔Mode Cam
④Load Rack
⑨Load Gear T
㉒Hole
⑬Load Gear S
㉘Axle
㉛Axle
㉓ Roller Base T Pin
⑰Hole
⑭Hook Load Gear S
⑮Spring Coil
⑬Load Gear S
⑰Hole
⑯Load Lever Ass'y S
Fig. B
⑳Axle
㉛Axle
⑲Axle
⑱ Roller Base S Pin
㉑INITIAL mode Positioning Alignment Holes
⑪Spring Coil
⑨Load Gear T
⑫Load Lever Ass'y T
㉒Hole (Grease here)
Fig. A
Fig. F
㉞INITIAL mode Positioning Alignment Holes
⑧Main Cam
㉔Mode Cam
⑨Load Gear T
Fig. C

Fig. 7-7-10. Loading Mechanism Main Parts

(2) MODE CAM (See Fig. 7-7-11.)

1. Removal

1) Set the INITIAL mode with the mode selector (VHJ-0050).
2) Remove the REINFORCE BRACKET as instructed in P.31.
3) Remove the two special washers ①, then remove the CAM PLATE SLIDE ASS'Y ②.
4) Remove the MODE CAM ③.

2. Remounting

1) Seeing P.31., confirm that the MAIN CAM is in the INITIAL mode position.
2) In case the MAIN CAM is misplaced, use the mode selector (VHJ-0050) to align the MAIN CAM positioning hole with the chassis INITIAL mode position hole (See P.31. for the INITIAL mode position). Since the ROTARY SWITCH (mode detector switch) does not rotate, the mode selector indicator lamp will not show the correct mode.
3) Align the ROTARY SWITCH (mode detector switch) ④ with the INITIAL mode positioning alignment mark ⑤ as shown in Fig. A.
4) Mount the MODE CAM ③ onto the axle ⑥. Do it so that the SLIDE CAM ASS'Y pin ⑪ is placed in the GROOVE 3 as shown in Fig. B.
5) Mount the CAM PLATE SLIDE ASS'Y ② onto the axles ⑥ and ⑦. Do it so that the pin ⑧ gets into the GROOVE 4 of the MODE CAM as shown in Fig. B, and the point of the bent-up part ⑨ into the ACT PLATE SLIDE ASS'Y hole ⑩.
6) Mount the two special washers ① onto the axles ⑥ and ⑦.
7) Mount the REINFORCE BRACKET as instructed in P.31.

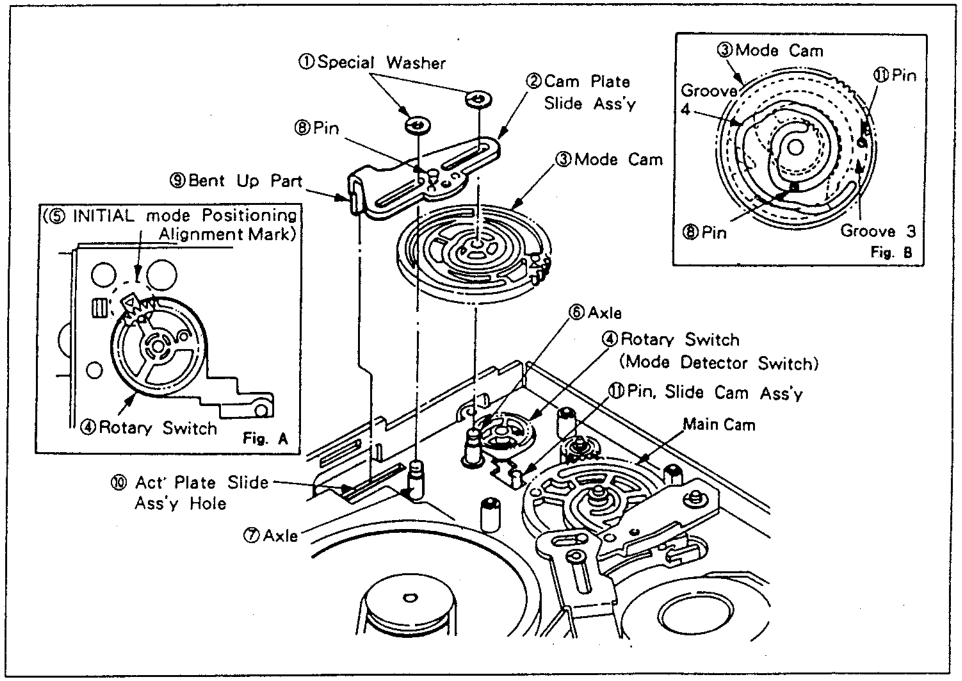

①Special Washer
②Cam Plate Slide Ass'y
⑧Pin
⑨Bent Up Part
③Mode Cam
③Mode Cam
Groove 4
⑪Pin
⑧Pin
Groove 3
Fig. B
(⑤ INITIAL mode Positioning Alignment Mark)
④Rotary Switch
Fig. A
⑥Axle
④Rotary Switch (Mode Detector Switch)
⑪Pin, Slide Cam Ass'y
Main Cam
⑩ Act' Plate Slide Ass'y Hole
⑦Axle

Fig. 7-7-11. Mode Cam

7-7-5. COMPL Head Bracket (ACE Head)
(See Fig. 7-7-12.)

1. Removal
1) Remove the special nut ②.
2) Remove the SLEEVE ③, the COMPL HEAD BRACKET ① and the SPRING COIL ④, in that order.

Note: Take care not to scratch or soil the ACE head surface.

2. Remounting
1) Apply grease to the axle ⑥ as shown in Fig. A.
2) Apply grease to the spot where the COMPL HEAD BRACKET ① makes contact with the STOPPER ⑦.
3) Mount the SPRING COIL ④ and the COMPL HEAD BRACKET ①, in that order, onto the axle ⑥. Hook one end of the SPRING COIL ④ to the notch ⑤, and the other end to the COMPL HEAD BRACKET, so that the COMPL HEAD BRACKET is pressed against the STOPPER ⑦.
4) Mount the special nut ② onto the axle ⑥ through the SLEEVE ③.
5) Clean the ACE head surface with a chamois leather moistened with methyl alcohol.
6) Perform ACE head adjustment as instructed in 7-4.

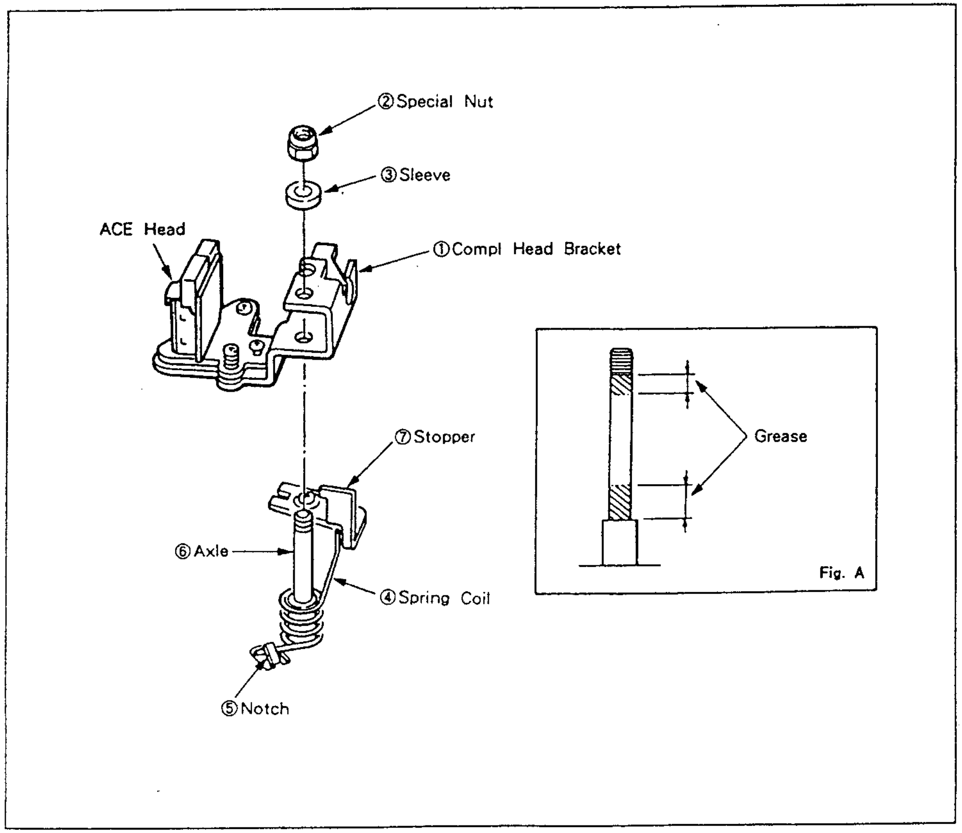

②Special Nut
③Sleeve
ACE Head
①Compl Head Bracket
⑦Stopper
⑥Axle
④Spring Coil
⑤Notch
Grease
Fig. A

Fig. 8-7-12. Compl Head Bracket (ACE Head)

7-7-6. Pinch Roller Pressure Mechanism
(See Fig. 7-7-13.)

1. Removal
1) Remove the COMPL CASSETTE MECHANISM as instructed in P.22.
2) Remove the COMPL HEAD BRACKET as instructed in 7-7-5.
3) Remove the PINCH SPRING COIL ①.
4) Remove the special washer ②, then remove the PINCH LEVER ASS'Y ③.
5) Remove the REV GUIDE LEVER SPRING COIL ④.
6) Remove REV GUIDE LEVER ASS'Y ⑥ from the hook ⑤ of the plastic bearing on the bottom side. Use a jig VHJ-0073 shown in Fig. 7-7-14. to widen the hook of the plastic bearing. By so doing, the above removal of the REV GUIDE LEVER ASS'Y ⑥ can be made more easily. Care should be taken to avoid pushing the jig VHJ-0073 too much. Pushing it too hard may damage the hook in an extreme case.
7) Remove the SLIDE BRAKE SPRING COIL ⑦.
8) Remove the special washer ⑧, then remove the PINCH CAM LEVER ASS'Y ⑨.
9) Remove the ACT PINCH SLIDE ASS'Y ⑩.

Note: If the hook ⑤ of the plastic bearing is damaged, reference should be made to Section 3. "Method of Repairing the Bearing Section of REV GUIDE LEVER ASS'Y".

2. Remounting
1) Apply grease to pins ⑫/⑬ and axles ⑯/⑱.
2) Apply grease to the ACT PINCH SLIDE ASS'Y pin ⑰.
3) Set the INITIAL mode with the mode selector (VHJ-0050).
4) Mount the ACT PINCH SLIDE ASS'Y ⑩ onto pins ⑫ and ⑬.
5) Insert the pin ⑭ of the PINCH CAM LEVER ASS'Y ⑨ into the MAIN CAM ⑪ GROOVE 1, and mount onto the axle ⑯ while inserting the ACT PINCH SLIDE ASS'Y pin ⑰ of the ACT PINCH SLIDE ASS'Y into the hole ⑮.
6) Mount the special washer ⑧ onto the axle ⑯.
7) Hook the SLIDE BRAKE SPRING COIL ⑦ to the plastic pin ⑲.
8) Mount the REV GUIDE LEVER ASS'Y ⑥ to the plastic molding bearing, then fix it with the hook ⑤ at the bottom.
9) Hook the REV GUIDE LEVER SPRING COIL ④.
10) Mount the PINCH LEVER ASS'Y ③ to the axle ⑱.
11) Mount the special washer ② to the axle ⑱.
12) Hook the PINCH SPRING COIL ① between the ACT PINCH SLIDE ASS'Y ⑩ and the PINCH LEVER ASS'Y ③.
13) Mount the COMPL HEAD BRACKET as instructed in 7-7-5.
14) Mount the COMPL CASSETTE MECHANISM as instructed in P.22.
15) Perform ACE head adjustment as instructed in 7-4.

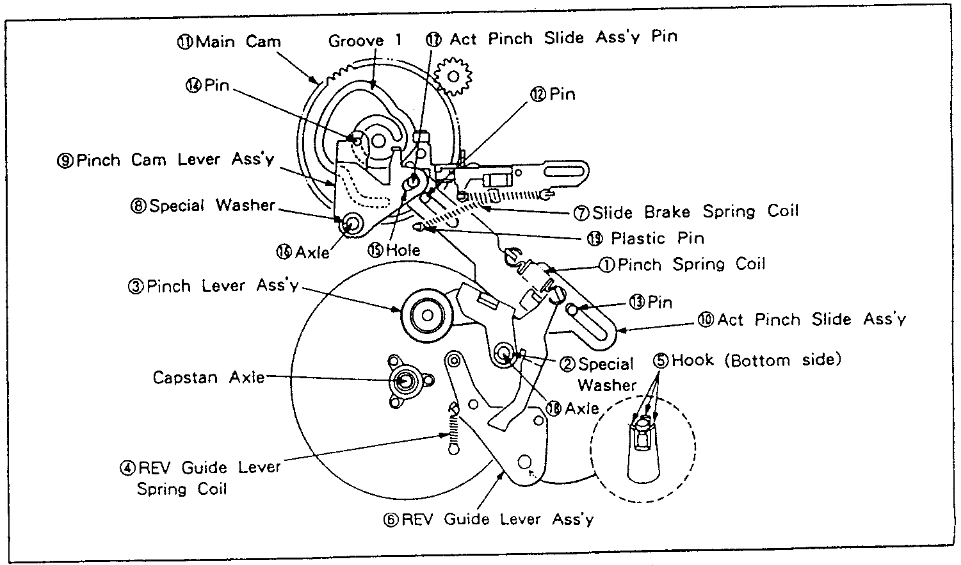
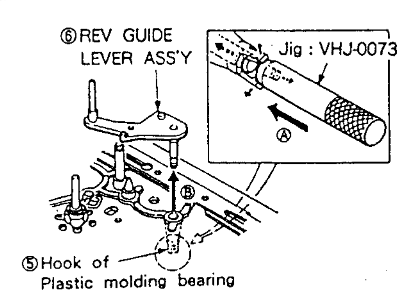

⑪Main Cam
Groove 1
⑰ Act Pinch Slide Ass'y Pin
⑭Pin
⑫Pin
⑨Pinch Cam Lever Ass'y
⑧Special Washer
⑦Slide Brake Spring Coil
⑲ Plastic Pin
⑯Axle
⑮Hole
①Pinch Spring Coil
③Pinch Lever Ass'y
⑬Pin
⑩Act Pinch Slide Ass'y
②Special Washer
⑤Hook (Bottom side)
Capstan Axle
⑱Axle
④REV Guide Lever Spring Coil
⑥REV Guide Lever Ass'y

Fig. 7-7-13. Pinch Roller Pressure Mechanism


⑥REV GUIDE LEVER ASS'Y
Jig : VHJ-0073
Ⓐ
Ⓑ
⑤Hook of Plastic molding bearing

Remove REV GUIDE LEVER ASS'Y in the direction of arrow Ⓑ, pushing VHJ-0073 slightly in the direction of arrow Ⓐ.
Be careful not to damage the hook by pushing too much.

Fig. 7-7-14. Method of Using the jig VHJ-0073

3. Method of Repairing the Bearing Section of REV GUIDE LEVER ASS'Y

If the hook of the plastic molding bearing is damaged in the process of removing the REV GUIDE LEVER ASS'Y, proceed with the repair as follows:

1) Scrape the broken hook of the bearing section with a cutter knife and flatten it.
2) Insert the REV GUIDE LEVER ASS'Y in the bearing and fit a stopper washer in. The special washer to be used must be Part No. 3-735-755-01 WASHER (DIA.2.6). This special washer (part No. 3-735-755-01 WASHER (DIA.2.6)) is the same as that used on SUPPLY REEL ASS'Y or TAKE-UP REEL ASS'Y.

Remove the REV GUIDE LEVER ASS'Y toward an arrow B while pushing the jig VHJ-0073 lightly in the direction of an arrow.
Pushing the jig VHJ-0073 too much may cause hook breakage. Therefore, care should be taken.

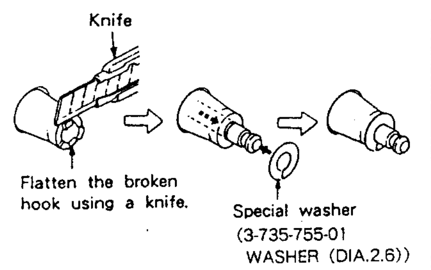

Knife
Flatten the broken hook using a knife.
Special washer (3-735-755-01 WASHER (DIA.2.6))

Fig. 7-7-15. **Method of Repairing the Bearing Section of the REV GUIDE LEVER ASSEMBLY**

7-7-7. Brake Mechanism

(1) SUB TAKE-UP BRAKE ASS'Y
(See Fig. 7-7-16.)

1. Removal
1) Remove the COMPL CASSETTE MECHANISM as instructed in P.22.
2) Remove the SPRING COIL ①.
3) While pushing the hook ② in the direction of arrow, remove the SUB TAKE-UP BRAKE ASS'Y ③.

2. Remounting
1) Mount the SUB TAKE-UP BRAKE ASS'Y ③ onto the pin ④. Confirm that the hook ② is firmly hooked to the chassis.
2) Fit the SPRING COIL between hooks ⑤ and ⑥.
3) Mount the COMPL CASSETTE MECHANISM as instructed in P.22.

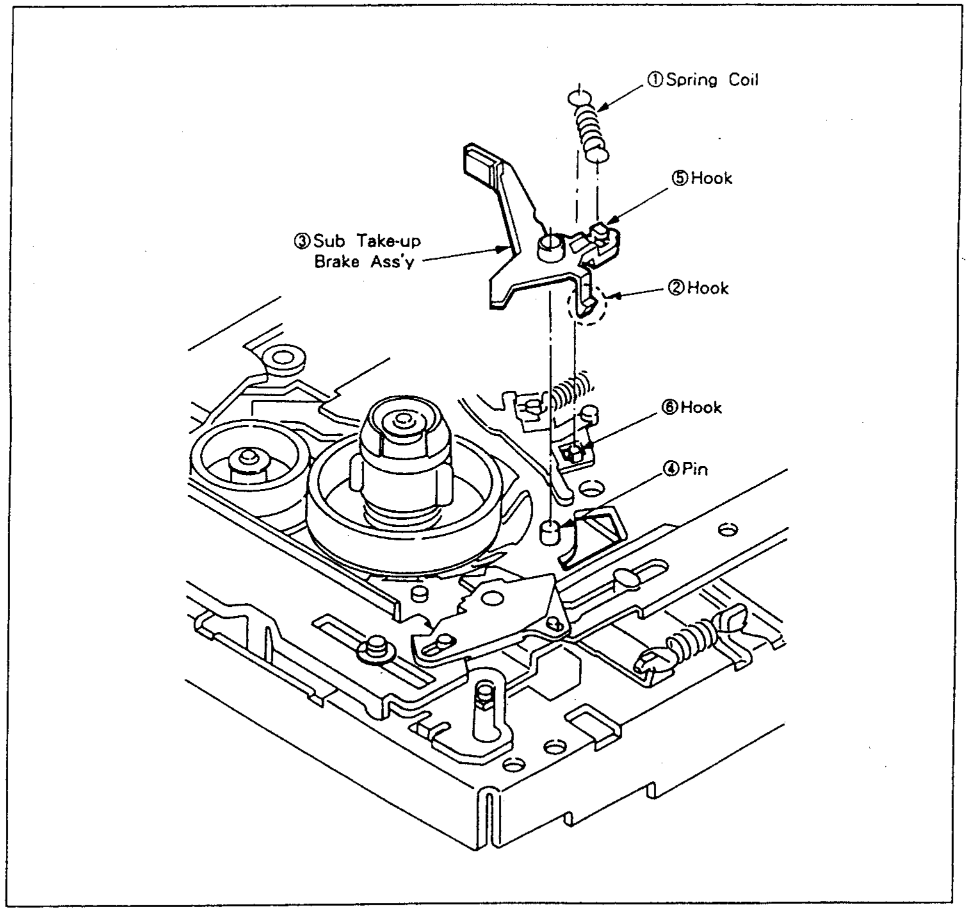

①Spring Coil
⑤Hook
③Sub Take-up Brake Ass'y
②Hook
⑥Hook
④Pin

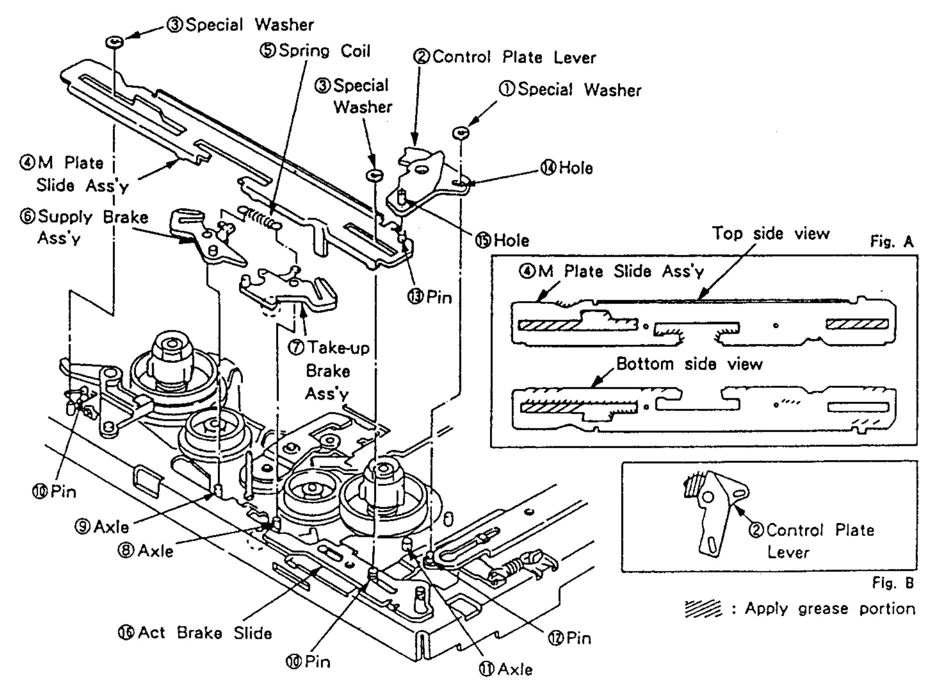
Fig. 7-7-16. Sub Take-up Brake Ass'y

(2) SUPPLY BRAKE ASS'Y AND TAKE-UP BRAKE ASS'Y (See Fig. 7-7-17)

1. Removal
1) Remove the COMPL CASSETTE MECHANISM as instructed in P.22.
2) Remove the SUB TAKE-UP BRAKE as instructed in P.37.
3) Remove the special washer ①, then remove the CONTROL PLATE LEVER ②.
4) Remove the two special washers ③, then remove the M PLATE SLIDE ASS'Y ④.
5) Remove the SPRING COIL ⑤.
6) Remove the SUPPLY BRAKE ASS'Y ⑥ and the TAKE-UP BRAKE ASS'Y ⑦.

Note: Take care not to soil the brake shoes.

2. Remounting
1) Apply a thin layer of grease to axles ⑧ and ⑨.
2) Mount the TAKE-UP BRAKE ASS'Y ⑦ onto the axle ⑧.
3) Mount the SUPPLY BRAKE ASS'Y ⑥ onto the axle ⑨.
4) After applying a thin layer of grease to the M PLATE SLIDE ASS'Y ④ as shown in Fig. A, mount it onto the two pins ⑩.
5) Mount the two special washers ③ onto the two pins ⑩.
6) After applying grease to the CONTROL PLATE LEVER ② as shown in Fig. B, mount it onto the axle ⑪. Insert the pin ⑫ of the ACT PLATE SLIDE ASS'Y into the hole ⑭, and the pin ⑬ of M PLATE SLIDE ASS'Y into the hole ⑮.
7) Mount the special washer ① onto the pin ⑫.
8) Mount the SUB TAKE-UP BRAKE as instructed in P.37.
9) Mount the COMPL CASSETTE MECHANISM as instructed in P.22.


③Special Washer
⑤Spring Coil
②Control Plate Lever
③Special Washer
①Special Washer
④M Plate Slide Ass'y
⑭Hole
⑥Supply Brake Ass'y
⑮Hole
⑬Pin
⑦Take-up Brake Ass'y
Top side view
Fig. A
④M Plate Slide Ass'y
Bottom side view
②Control Plate Lever
Fig. B
▨ : Apply grease portion
⑩Pin
⑨Axle
⑧Axle
⑯Act Brake Slide
⑩Pin
⑪Axle
⑫Pin

When assembling, the contact surfaces of Take-up Brake ⑦ and the Brake Slide ⑯ marked with ⁚ should contact but not overlap each other.

Fig. 7-7-17. Supply Brake Ass'y & Take-up Brake Ass'y

(3) TENSION LEVER ASS'Y AND BAND HOLDER ASSY (See Fig. 7-7-18)

1. Removal
1) Remove the COMPL CASSETTE MECHANISM as instructed in P.22.
2) Remove the SPRING COIL ①.
3) Remove the screw ③ fixing the BAND HOLDER ASS'Y ②.
4) Push the SUB SUPPLY BRAKE ④ in the direction of the arrow, setting the BAND HOLDER ASS'Y ② free.
5) Open the hook ⑤ a little and remove the TENSION LEVER ASS'Y ⑥. Take care not to open the hook ⑤ too much, otherwise it may be deformed or broken.
6) Remove the hook ⑦ of the BAND HOLDER ASS'Y.

2. Remounting
1) Mount the BAND HOLDER ASS'Y hook ⑦ into the TENSION LEVER ASS'Y hole ⑧.
2) Insert the TENSION LEVER ASS'Y axle ⑨ into the hole ⑩ and confirm that the hook ⑤ is hooked.
3) While pushing the SUB SUPPLY BRAKE ④ in the direction of arrow A, mount the BAND HOLDER ASS'Y ② with the screw ③.
4) Hook the SPRING COIL ① between the hooks ⑪ and ⑫.
5) Perform TENSION POLE position adjustment as instructed in 7-3.
6) Mount the COMPL CASSETTE MECHANISM as instructed in P.22.

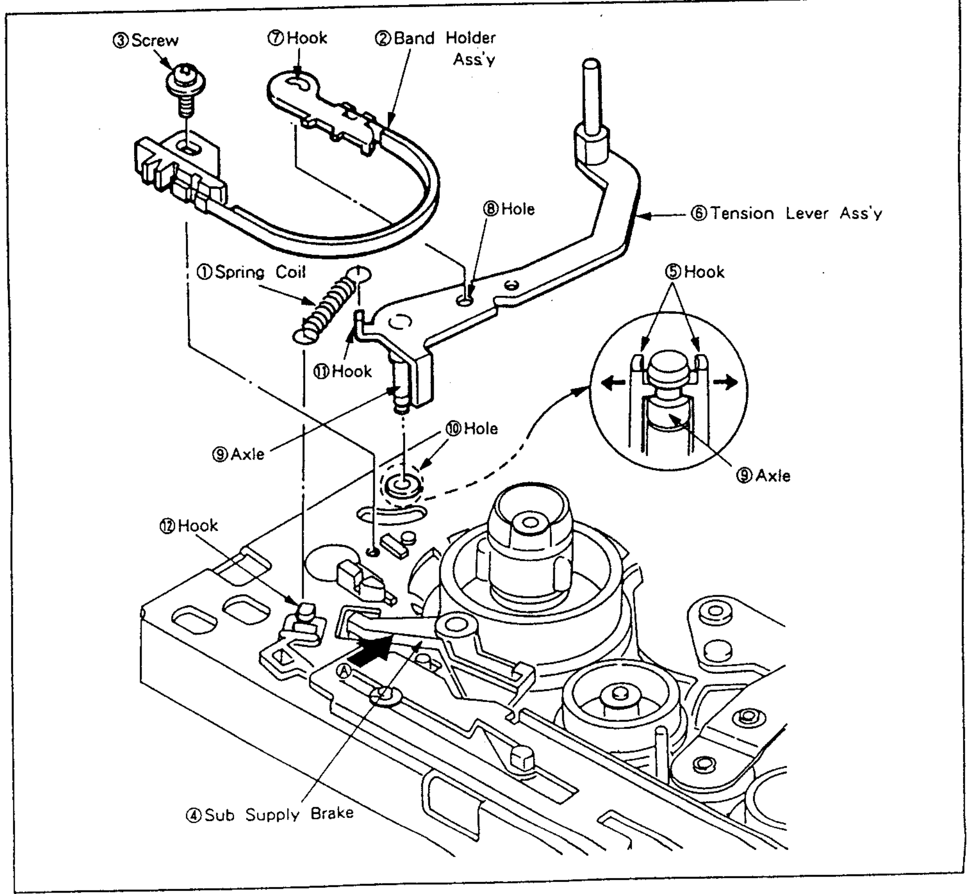

③Screw
⑦Hook
②Band Holder Ass'y
⑧Hole
⑥Tension Lever Ass'y
①Spring Coil
⑤Hook
⑪Hook
⑩Hole
⑨Axle
⑨Axle
⑫Hook
Ⓐ
④Sub Supply Brake

Fig. 7-7-18. Tension Lever Ass'y & Band Holder Ass'y

(4) CAPSTAN BRAKE ASS'Y (See Fig. 7-7-19)

1. Removal
1) Remove the SPRING COIL ①.
2) Unhook the hook ②, then remove the CAPSTAN BRAKE ASS'Y ③.

2. Remounting
1) Mount the CAPSTAN BRAKE ASS'Y ③ onto the axle ④. Confirm that the hook ② is hooked to the chassis.
2) Hook the SPRING COIL ① between hooks ⑤ and ⑥. Fix the hook ⑥ side with adhesive (use an adhesive that allows later detaching).

Note: As for the model with two video heads, there are two types: one with the spring coil ① and CAPSTAN BRAKE ASS'Y ③ mounted, and one where these parts are not mounted.

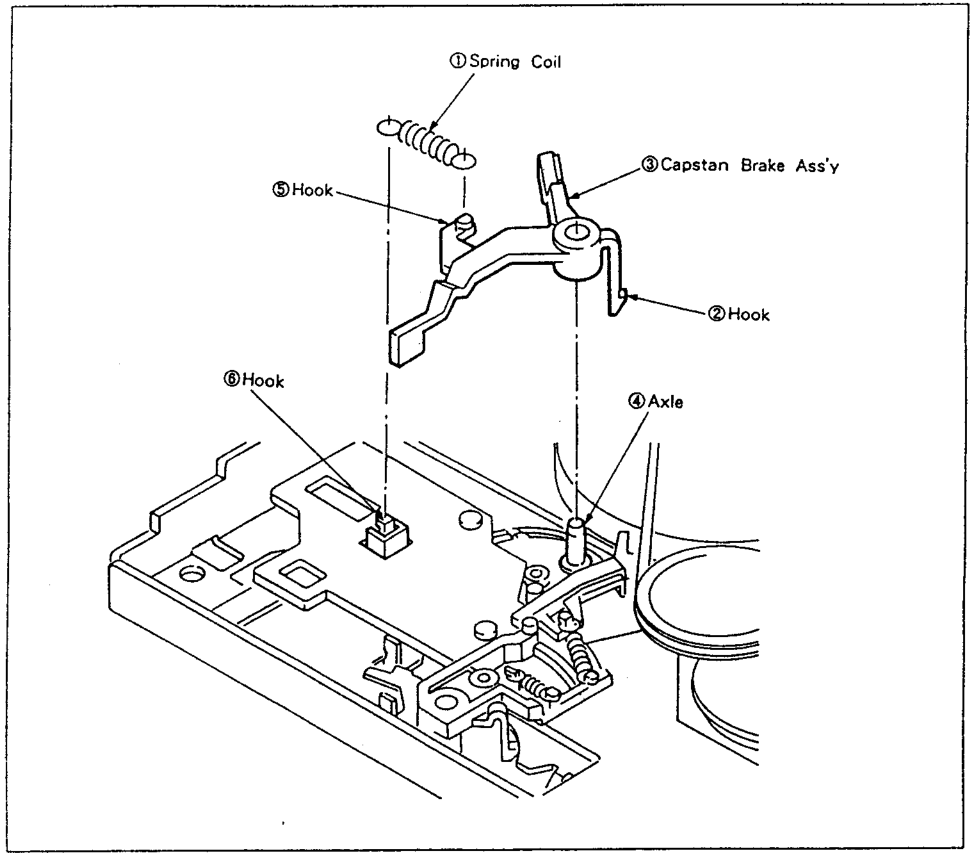


Fig. 7-7-19. Capstan Brake Ass'y

7-7-8. Reel Table Drive Mechanism

(1) SUPPLY REEL ASS'Y AND SUPPLY REEL GEAR (See Fig. 7-7-20.)

1. Removal
1) Remove the COMPL CASSETTE MECHANISM as instructed in P.22.
2) Remove the BAND HOLDER ASS'Y as instructed in P.39.
3) Set the PLAY mode with the mode selector (VHJ-0050).
4) Remove the special washer ①, then remove the SUPPLY REEL ASS'Y ② and the washer ③.
5) Remove the special washer ④.
6) While pushing the SUPPLY BRAKE ASS'Y ⑤ in the direction of arrow A, remove the SUPPLY REEL GEAR ⑥ and the washer ⑦.

Note: Be sure that no dirt gets on the section where both brake shoes make contact.

2. Remounting
1) Apply a little oil (less than one drop) to the part of the axle ⑧ indicated by the arrow B, then mount the washer ⑦.
2) While pushing the SUPPLY BRAKE ASS'Y ⑤ in the direction of arrow A, mount the SUPPLY REEL GEAR ⑥ onto the axle ⑧.
3) Mount the special washer ④ to the axle ⑧.
4) Apply 1 drop of oil to the part of the axle ⑨ indicated by the arrow C, then mount the washer ③.
5) Mount the SUPPLY REEL ASS'Y ② onto the axle ⑨.
6) Perform reel table height adjustment as instructed in P.4.
7) Mount the special washer ① onto the axle ⑨.
8) Mount the BAND HOLDER ASS'Y as instructed in P.39.
9) Perform tension pole position adjustment as instructed in 7-3.
10) Mount the COMPL CASSETTE MECHANISM as instructed in P.22.

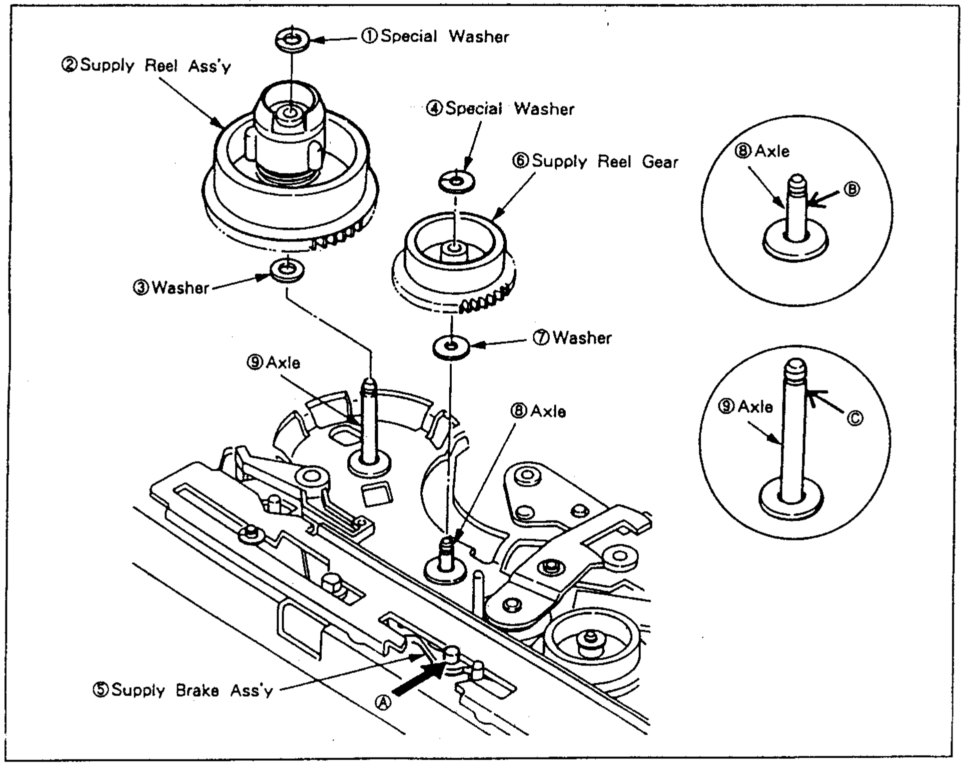


Fig. 7-7-20. Supply Reel Ass'y & Supply Reel Gear

(2) TAKE-UP REEL ASS'Y (See Fig. 7-7-21.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in P.22.
2) Remove the special washer ①.
3) Push the SUB TAKE-UP BRAKE ASS'Y ② in the direction of arrow A to release the brake, then remove the TAKE-UP REEL ASS'Y ③ and the washer ④.

Note: Be sure that no dirt gets on the section where both brake shoes make contact.

2. Remounting

1) Apply 1 drop of oil to the part of the axle ⑤ indicated by the arrow B, then mount the washer ④.
2) While pushing the SUB TAKE-UP BRAKE ASS'Y ② in the direction of arrow A, mount the TAKE-UP REEL ASS'Y ③ onto the axle ⑤.
3) Perform reel table height adjustment as instructed in 7-2.
4) Mount the special washer ① onto the axle ⑤.
5) Mount the COMPL CASSETTE MECHANISM as instructed in P.22.

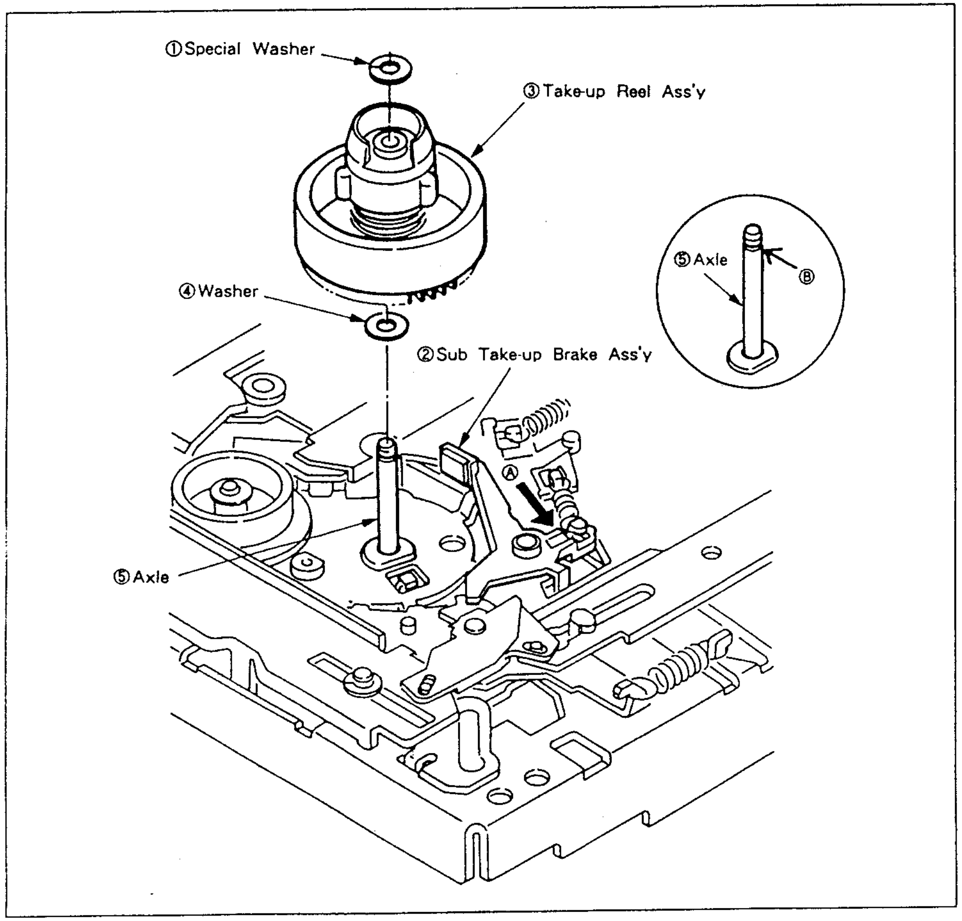


Fig. 7-7-21. Take-up Reel Ass'y

(3) TAKE-UP REEL GEAR (See Fig. 7-7-22.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in P.22.
2) Remove the TAKE-UP REEL ASS'Y as instructed in P.42.
3) Remove the SUB TAKE-UP BRAKE ASS'Y as instructed in P.37.
4) Remove the TAKE-UP BRAKE ASS'Y as instructed in P.38.
5) Remove the special washer ①, then remove the TAKE-UP REEL GEAR ③ and the washer ④.

2. Remounting

1) Apply a little oil (less than one drop) to the part of the axle ⑤ indicated with an arrow.
2) Mount the washer ④ and the TAKE-UP REEL GEAR ③ onto the axle ⑤.
3) Mount the special washer ① onto the axle ⑤.
4) Mount the TAKE-UP BRAKE ASS'Y as instructed in P.38.
5) Mount the SUB TAKE-UP BRAKE ASS'Y as instructed in P.37.
6) Mount the TAKE-UP REEL ASS'Y as instructed in P.42.
7) Mount the COMPL CASSETTE MECHANISM as instructed in P.22.

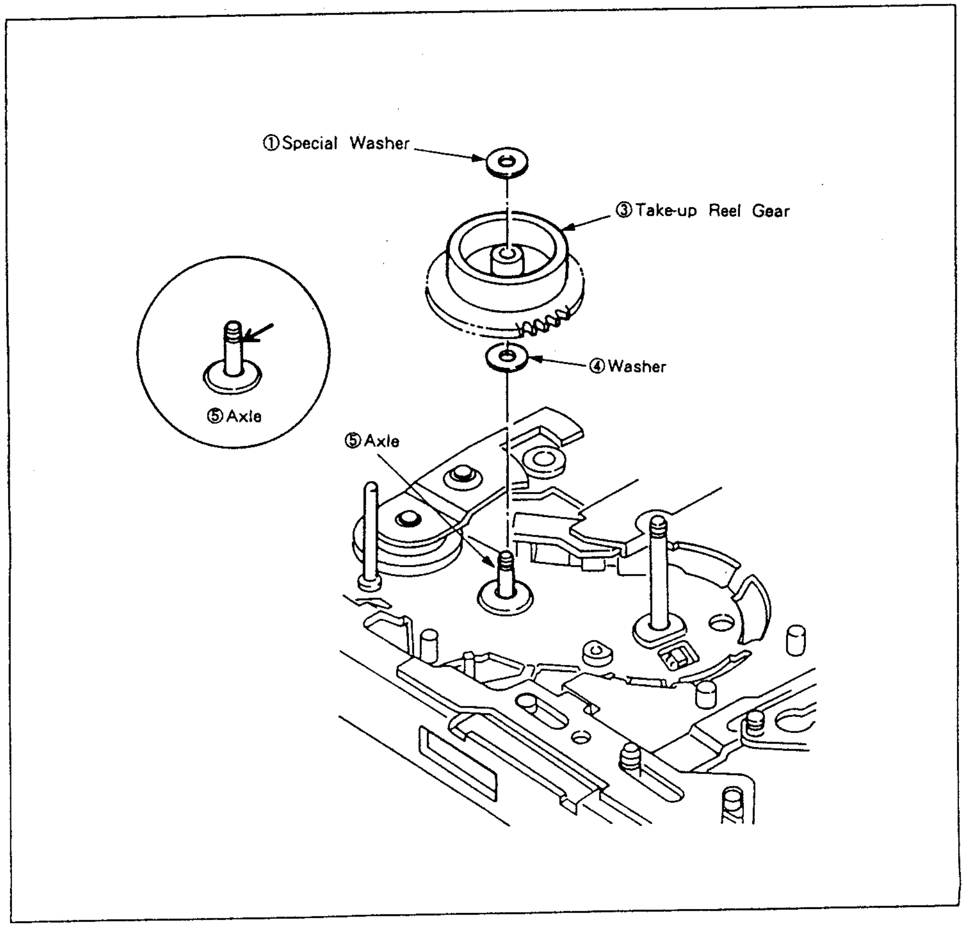


Fig. 7-7-22. Take-up Reel Geay

(4) REEL PULLEY AND FRICTION GEAR ASS'Y (See Fig. 7-7-23.)

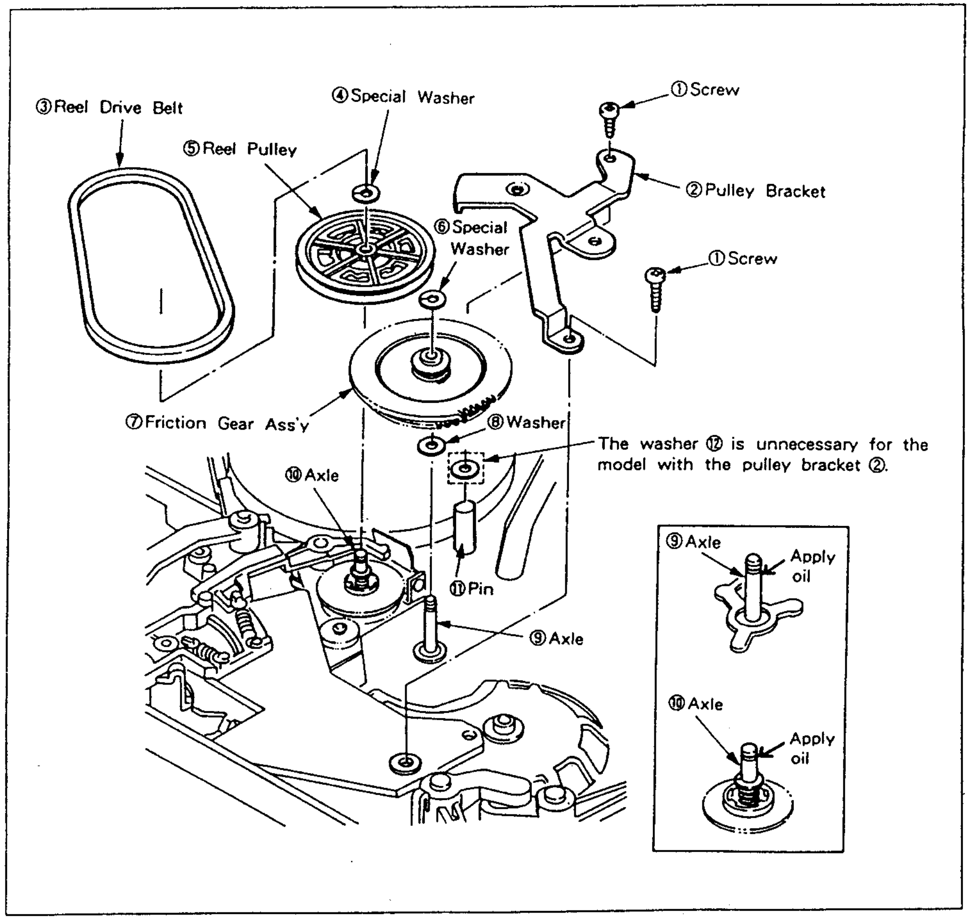
1. Removal

1) Remove the two screws ①, then remove the PULLEY BRACKET ②.
2) Remove the REEL DRIVE BELT ③.
3) Remove the special washer ④, then remove the REEL PULLEY ⑤.
4) Remove the special washer ⑥, then remove the FRICTION GEAR ASS'Y ⑦ and the washer ⑧.

Note: Some model may not incorporate the pulley bracket ②. Washer ⑫ is mounted on the pin ⑪ with a screw ①, and servesas the PULLEY BRACKET ②.

2. Remounting

1) Apply one drop of oil to the parts of axles ⑨ and ⑩ indicated with arrows.
2) Mount the washer ⑧ and the FRICTION GEAR ASS'Y ⑦ onto the axle ⑨.
3) Mount the special washer ⑥ onto the axle ⑨.
4) Mount the REEL PULLEY ⑤ onto the axle ⑩.
5) Mount the special washer ④ onto the axle ⑩.
6) Set the REEL DRIVE BELT ③.
7) Mount the PULLEY BRACKET ② with the two screws ①.


③Reel Drive Belt
④Special Washer
⑤Reel Pulley
①Screw
②Pulley Bracket
⑥Special Washer
①Screw
⑦Friction Gear Ass'y
⑧Washer
⑩Axle
⑪Pin
⑨Axle
⑨Axle
Apply oil
⑩Axle
Apply oil

The washer ⑫ is unnecessary for the model with the pulley bracket ②.

Fig. 7-7-23. Reel Pulley & Friction Gear

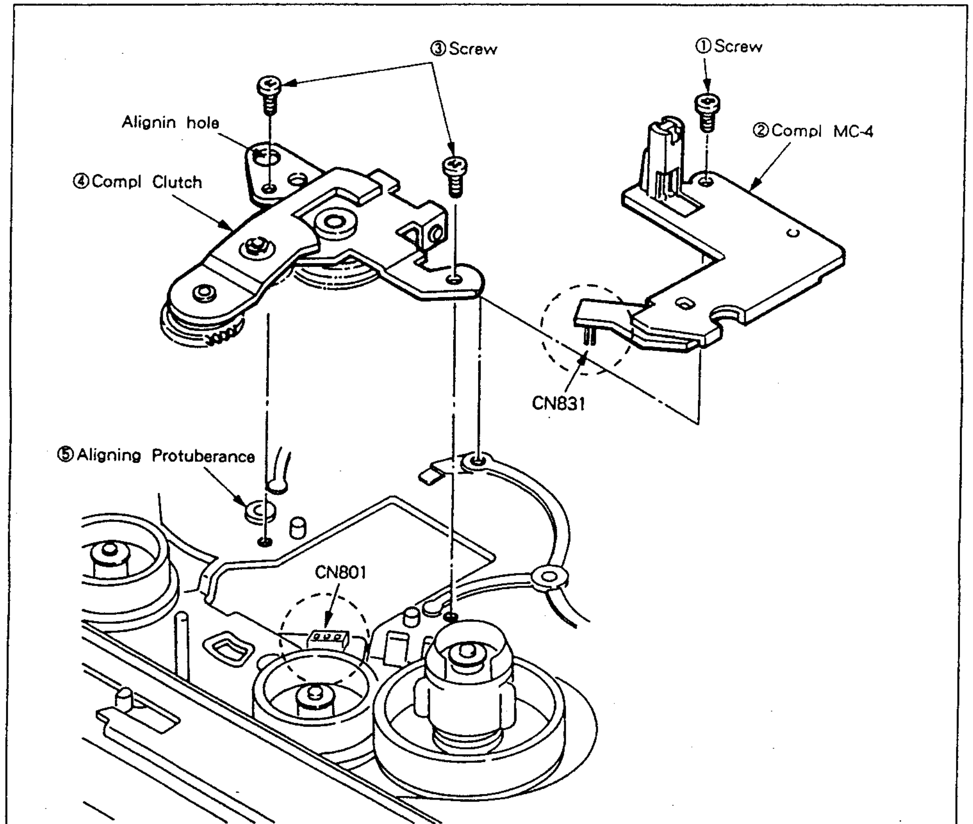
(5) COMPL CLUTCH (See Fig. 7-7-24.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in P.22.
2) Remove the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in P.44.
3) Remove the screw ①, then remove the COMPL MC-4 ②.
4) Remove the two screws ③, then remove the COMPL CLUTCH ④.

2. Remounting

1) Mount the COMPL CLUTCH ④ with the two screws ③, aligning it with the protuberance ⑤.
2) After inserting the CN831 (COMPL MC-4) into the CN801 (COMPL MC-1), mount the COMPL MC-4 with the screw ①.
3) Mount the REEL PULLEY, the REEL DRIVE BELT and the PULLEY BRACKET as instructed in P.44.
4) Mount the COMPL CASSETTE MECHANISM as instructed in P.22.


③Screw
①Screw
Alignin hole
②Compl MC-4
④Compl Clutch
CN831
⑤Aligning Protuberance
CN801

Note: The form of CN801 and CN 831 differ from the former that.

Fig. 7-7-24. Compl Clutch

(6) CLUTCH CHANGE LEVER AND CLUTCH LEVER ASS'Y (See Fig. 7-7-25.)

1. Removal
1) Remove the CAPSTAN BRAKE ASS'Y as instructed in P.40.
2) Remove the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in P.44.
3) Remove the SPRING COIL ①.
4) Unhook the hook ②, then remove the CLUTCH CHANGE LEVER ③.
5) Unhook the hook ⑤, then remove the CLUTCH LEVER ASS'Y ⑥.

2. Remounting
1) Mount the CLUTCH LEVER ASS'Y ⑥ onto the axle ⑦. Confirm that the hook ⑤ is hooked to the chassis.
2) Mount the CLUTCH CHANGE LEVER ③ onto the axle ⑧. Confirm that the hook ② is hooked to the chassis.
3) Hook the SPRING COIL ① between the hooks ⑨ and ⑩.
4) Mount the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in P.44.
5) Mount the CAPSTAN BRAKE ASS'Y as instructed in P.40.

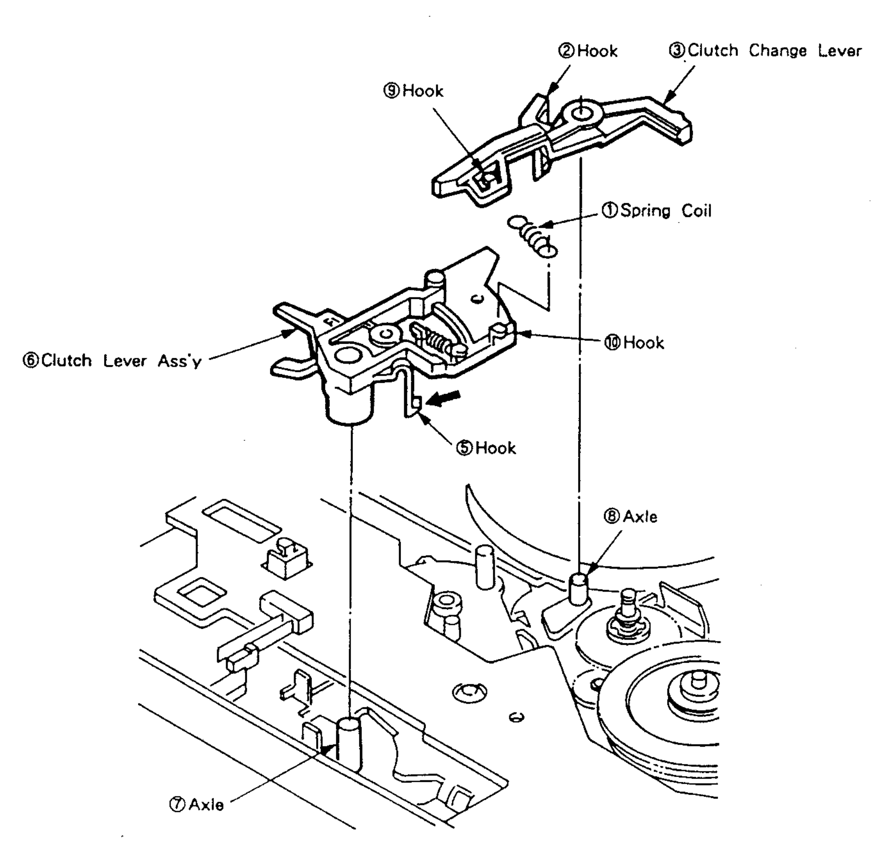

②Hook
③Clutch Change Lever
⑨Hook
①Spring Coil
⑩Hook
⑥Clutch Lever Ass'y
⑤Hook
⑧Axle
⑦Axle

Fig. 7-7-25. **Clutch Change Lever & Clutch Lever Ass'y**

7-7-9. Capstan Motor (See Fig. 7-7-26.)

1. Removal
1) Remove the CAPSTAN BRAKE ASS'Y as instructed in P.40.
2) Remove the CAPSTAN MOTOR ⑥ connector.
3) Remove the REEL DRIVE BELT ② from the CAPSTAN MOTOR PULLEY ①.
4) Remove the two screws ④ fixing the COMPL CASSETTE MECHANISM TOP BOARD ③, then slide the TOP BOARD ③ backward.
5) Remove the three screws ⑤, then remove the CAPSTAN MOTOR ⑥.

Note: Take care not to scratch or soil the capstan axle.

2. Remounting
1) Mount the CAPSTAN MOTOR ⑥ with the three screws ⑤.
2) Connect the CAPSTAN MOTOR ⑥ connector.
3) Mount the TOP BOARD ③ with the two screws ④.
4) Fit the REEL DRIVE BELT ② around the CAPSTAN MOTOR PULLEY ① and the REEL PULLEY ⑦.
5) Mount the CAPSTAN BRAKE ASS'Y as instructed in P.40.

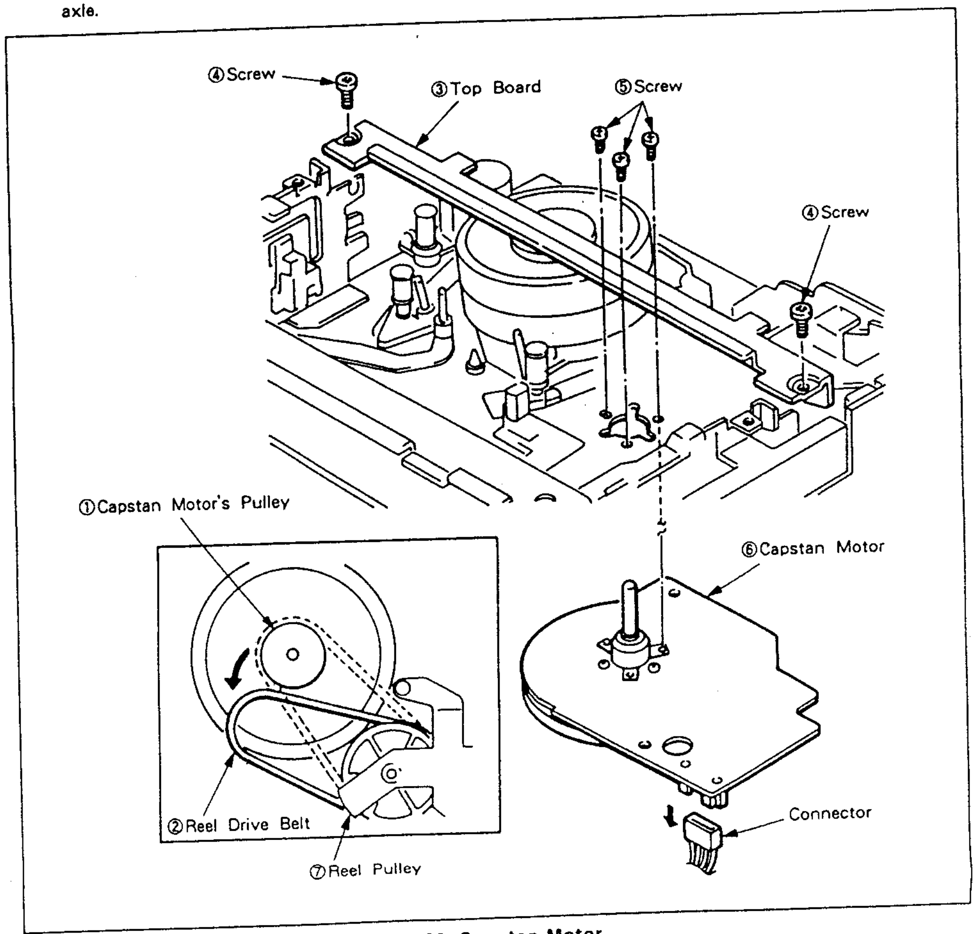

④Screw
③Top Board
⑤Screw
④Screw
①Capstan Motor's Pulley
⑥Capstan Motor
②Reel Drive Belt
⑦Reel Pulley
Connector

Fig. 7-7-26. **Capstan Motor**

7-7-10. Fixed Guide, FE Head Lever Ass'y

(1) S-SIDE FIXED GUIDE AND FE LEVER ASS'Y
(See Fig. 7-7-27.)

1. Removal

1) Remove the special nut ①, then remove the GUIDE PIPE ③ and the special washer ② (lower), in that order.
2) Remove the SPRING COIL ⑤.
3) Remove the FTE HEAD connector.
4) Remove the special washer ⑥, then remove the FE HEAD LEVER ASS'Y ⑦.

2. Remounting

1) After mounting the FE LEVER ASS'Y ⑦ onto the axle ⑧, mount the special washer ⑥.
2) Hook the SPRING COIL ⑤ between the chassis notch ⑨ and the FE LEVER ASS'Y hook ⑩.
3) Mount the special washer ② (lower), the GUIDE pipe ③ and the special nut ① to the axle ⑧, in that order. At that time, do not excessively tighten the special nut ① to avoid idle rotation of the axle rivet. The height of fixing guide on the inlet side is not required.
4) Connect the connector to the FTE HEAD.

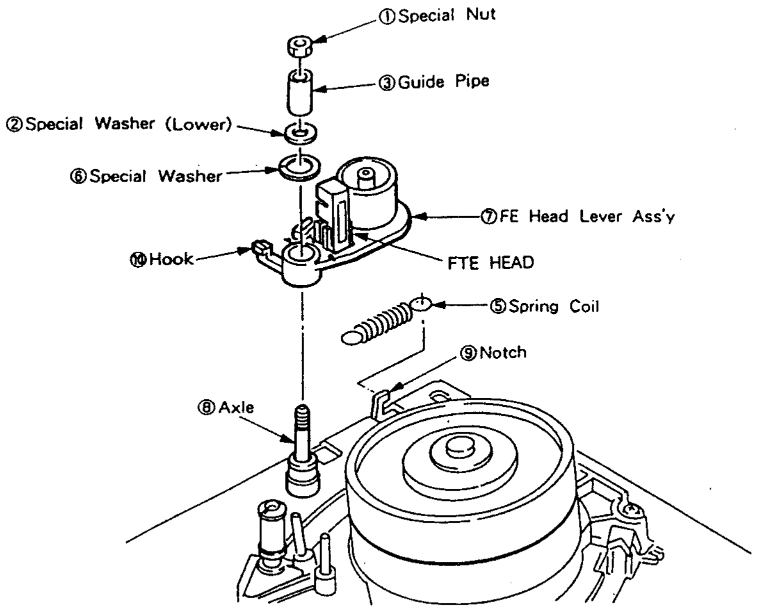

①Special Nut
③Guide Pipe
②Special Washer (Lower)
⑥Special Washer
⑦FE Head Lever Ass'y
⑩Hook
FTE HEAD
⑤Spring Coil
⑨Notch
⑧Axle

Fig. 7-7-27. Fixed Guide(S) & FE Lever Ass'y

(2) IMPEDANCE ROLLER, FTE HEAD
(See Fig. 7-7-28.)

1. Removal

1) Remove the FTE HEAD (full track erase head) ① connector.
2) Remove the special washer ②, then remove the IMPEDANCE ROLLER ③ and the washer ④.
3) Open the hook ⑤ a little and remove the FTE HEAD ①.

Note: Take care not to open the hook too much, otherwise it may be deformed or broken.

2. Remounting

1) Mount the FTE HEAD ① onto the FE HEAD LEVER ASS'Y ⑥. Confirm that the hook ⑤ is hooked to the FTE HEAD ①.
2) Mount the washer ④ and the IMPEDANCE ROLLER ③, in that order, onto the axle ⑦, then mount the special washer ②.
3) Connect the connector to the terminal of the FTE HEAD ①.

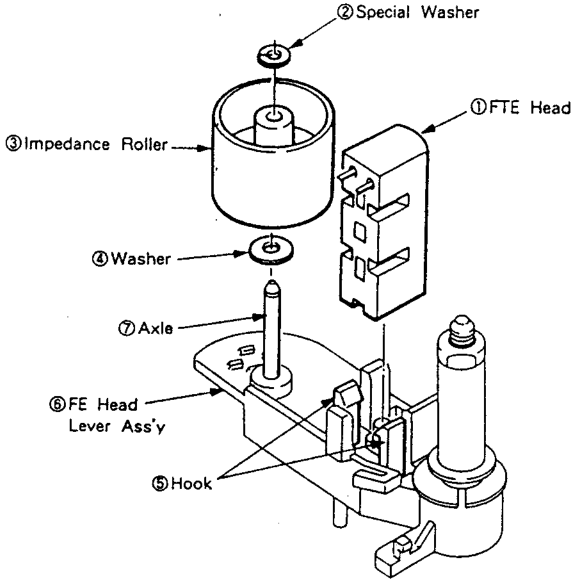

②Special Washer
①FTE Head
③Impedance Roller
④Washer
⑦Axle
⑥FE Head Lever Ass'y
⑤Hook

Fig. 7-7-28. Impedance Roller & FTE Head

(3) FIXED GUIDE (T) (See Fig. 7-7-29.)

1. Removal

1) Remove the CAP ①.

2) Remove the special nut ②, then remove the special washer ③ (upper), the GUIDE PIPE ④, the special washer ③ (lower) and the Spring Coil ⑤, in that order.

2. Remounting

1) Mount the Spring Coil ⑤, the special washer ③ (lower), the GUIDE PIPE ④, the special washer ③ (upper) and the special nut ②, in that order, to the axle ⑥.

2) Mount the CAP ① onto the axle ⑥.

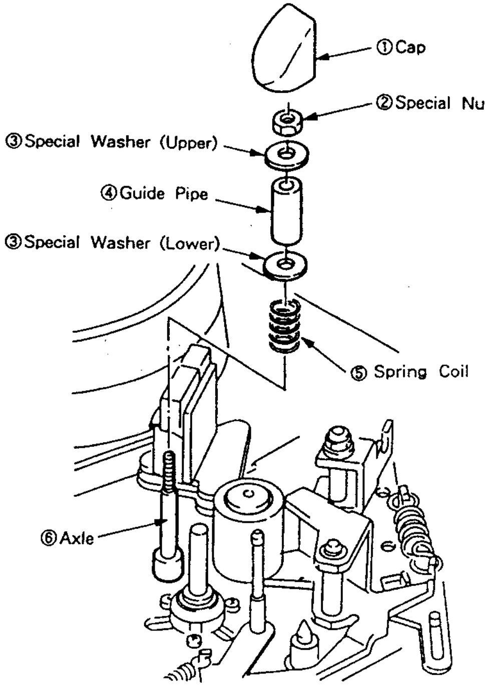

①Cap
②Special Nut
③Special Washer (Upper)
④Guide Pipe
③Special Washer (Lower)
⑤ Spring Coil
⑥Axle

Fig. 7-7-29. Fixed Guide (T)

7-7-11. Drum Section

(1) DRUM MOTOR (ROTOR, STATOR) (See Fig. 7-7-30.)

1. Removal

1) Remove the screw ①, then remove the CYLINDER EARTH ASS'Y ②.

2) Remove the two screws ③, then remove the ROTOR ④ and the SPACER.

3) Remove the STATOR board connector.

4) Remove the three screws ⑤, then remove the STATOR ⑥.

2. Remounting

1) Mount the STATOR ⑥ with the three screws ⑤.

2) Mount the SPACER ⑪ onto the AXLE ⑫.

3) While aligning the ROTOR oval hole ⑦ with the ROTOR DISK hole ⑧, mount the ROTOR with the two screws ③.

4) Insert the connector ⑩.

5) While aligning the CYLINDER EARTH ASS'Y ② protuberance with the chassis hole ⑨, mount it with the screw ①.

Note 1: Use a torque driver (VHJ-0014) for mounting the STATOR ⑥ and the ROTOR ④. Set fastening torque to 3 kg-cm.

Note 2: When the drum unit has been replaced, perform a tape path adjustment as instructed in 7-4. and perform a SW PHASE adjustment of the servo circuit.

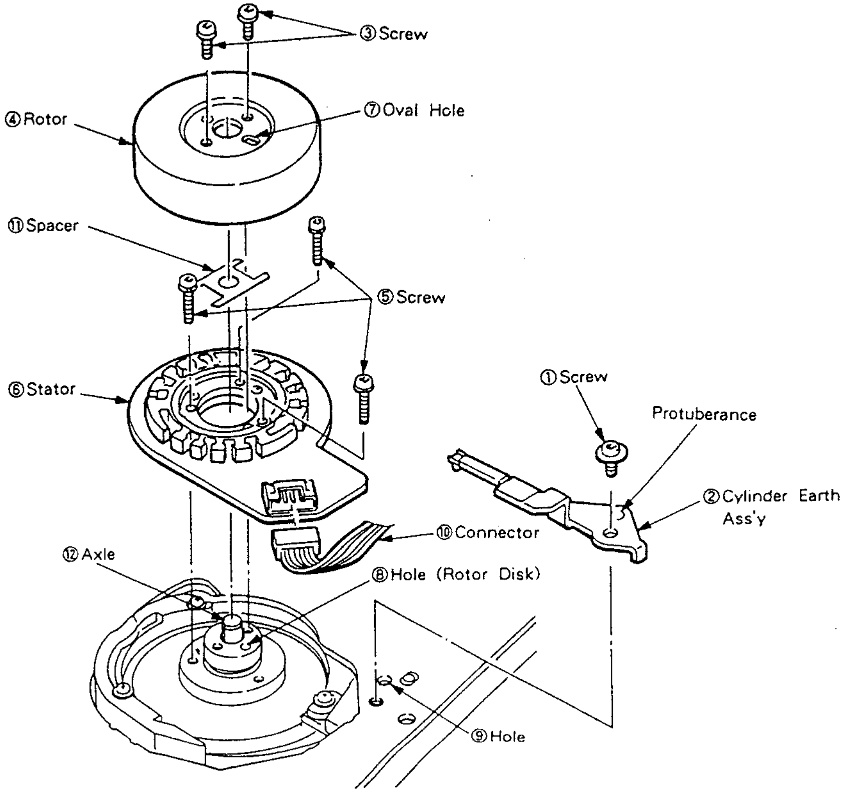

③Screw
④Rotor
⑦Oval Hole
⑪Spacer
⑤Screw
⑥Stator
①Screw
Protuberance
②Cylinder Earth Ass'y
⑩Connector
⑫Axle
⑧Hole (Rotor Disk)
⑨Hole

Fig. 7-7-30. Drum Motor

(2) DRUM UNIT (See Fig. 7-7-31.)

1. Removal

1) For some models with the board located above the upper drum, remove the board.
2) Remove the flexible cable ① from the PRE-AMP UNIT (take care not to pull the flexible cable in the upward direction).
3) Remove the LOAD RACK only, as instructed in P.149.
4) Remove the three screws ②, then remove the drum unit ③.

Note: When removing and remounting the drum unit, handle it carefully to protect it from scratches and dirt.

2. Remounting

1) While aligning the drum unit ③ to the protuberance, mount it to the drum base (CYLINDER BASE) ⑤ with the three screws ②.
2) Mount the ROAD RACK as instructed in P.31.
3) Insert the flexible cable into the PRE-AMP UNIT.
4) Clean the drum unit.
5) Perform the tape path adjustment as instructed in 8-4. and perform the SW PHASE adjustment of the servo circuit.

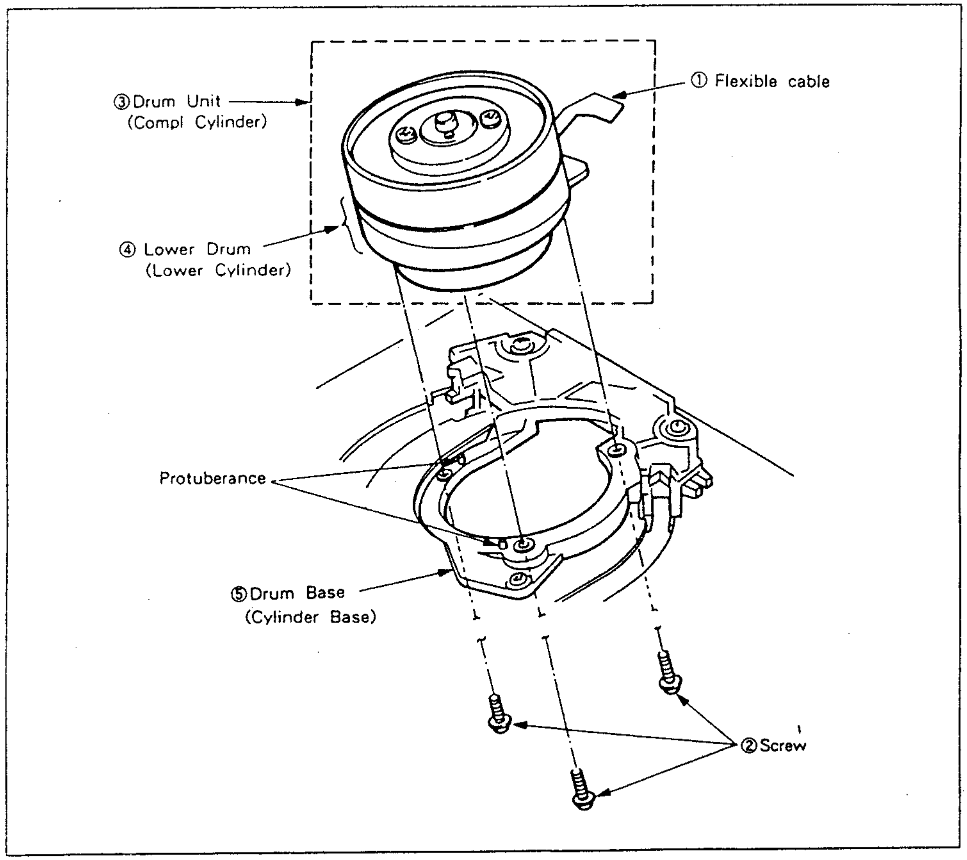

③Drum Unit
(Compl Cylinder)
① Flexible cable
④ Lower Drum
(Lower Cylinder)
Protuberance
⑤Drum Base
(Cylinder Base)
②Screw

Fig. 7-7-31. Drum Unit (Compl Cylinder)

(3) UPPER DRUM (Upper Cylinder)

1. Removal

1) Remove the two screws ①. (See Fig. 7-7-32.)
2) In case the RE (ROTARY ERASE) HEAD is attached to the upper drum (UPPER CYLINDER), remove the lead wires soldered from the P.C. board. (See Fig. 7-7-33.)
3) Turn the head removing jig (VHJ-0041) handle ② counterclockwise to lift up the stopper ③. (See Fig. 7-7-34.)
4) Insert the two long screws ④ of the jig into the screw holes ⑥ located on the head chip side of the upper drum (UPPER CYLINDER) ⑤, then mount by turning the handle clockwise.
5) While holding the jig so that the upper drum ⑤ does not rotate, turn the handle ② clockwise to remove the upper drum.
6) Remove the jig from the upper drum.

Note: Handle parts carefully to protect the drum from scratches and dirt, and the video head from damage.

"Disassemble"

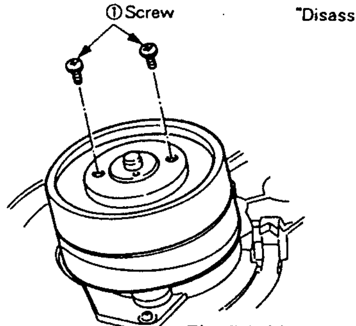


Fig. 7-7-32.

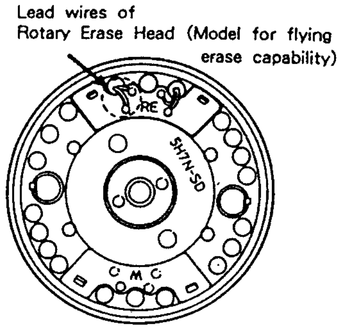

Lead wires of
Rotary Erase Head (Model for flying
erase capability)
RE
SH7N-SD
C M C

Fig. 7-7-33.

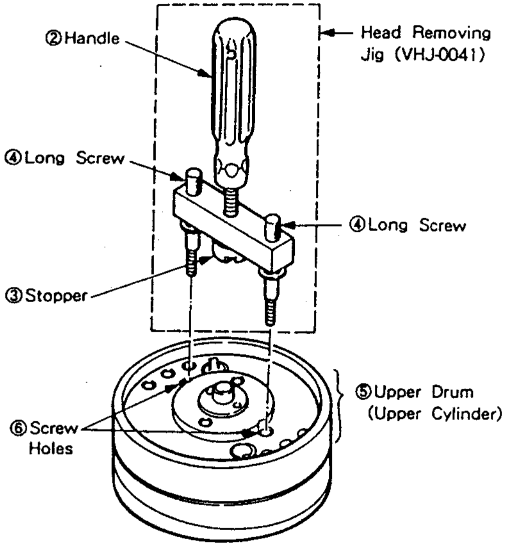

②Handle
Head Removing
Jig (VHJ-0041)
④Long Screw
④Long Screw
③Stopper
⑤Upper Drum
(Upper Cylinder)
⑥Screw
Holes

Fig. 7-7-34.

Upper Drum (Upper Cylinder)

2. Remounting (See Fig. 7-7-35.)

1) Confirm that surfaces where the flywheel and the upper drum (UPPER CYLINDER) are engaged or make contact are free from scratches and dirt.

2) The code name ① of the drum is printed on the video head side of the upper drum ⑤ SP CH-1 (channel A, plus azimuth). The code name ① is set with in the rotary transformer terminal round hole side ② position of lower drum (LOWER CYLINDER), so that the two screw holes ③ of the upper drum are aligned with the two screw holes ④ of the flywheel. (Refer to 3. Recognizing the SP CH-1 Head side.)

3) In case the RE (ROTARY ERASE) HEAD is attached to the upper drum, pass the lead wires through the lead wire hole. (See Fig. 7-7-33.)

4) While keeping the upper drum ⑤ parallel to the lower drum (LOWER CYLINDER) ⑧, insert it completely into the flywheel.

5) Temporarily tighten the two screws ⑦ alternately a little at a time, then tighten them to a torque of 6 kg-cm using a torque driver (VHJ-0014) and a 3 mm bit (VHJ-0045).

6) In case the RE head is attached to the upper drum ⑤, solder the lead wires to the P.C. board. Solder the red lead wire to the R terminal, and the yellow lead wire to the Y terminal.

Note: When the upper drum has been replaced, perform a tape path adjustment as instructed in 7-4. and the SW PHASE adjustment of the servo circuit.

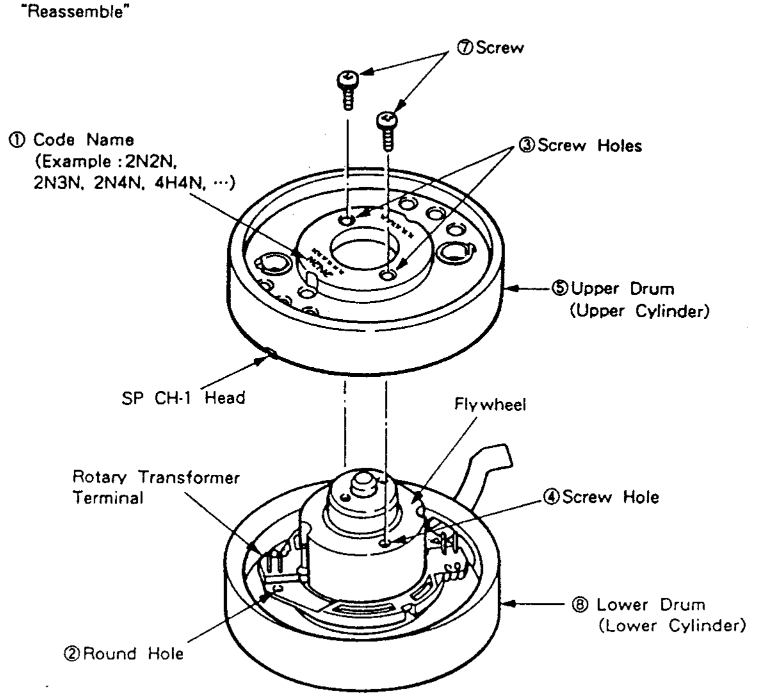

"Reassemble"
⑦Screw
① Code Name
(Example : 2N2N,
2N3N, 2N4N, 4H4N, ···)
③Screw Holes
⑤Upper Drum
(Upper Cylinder)
SP CH-1 Head
Flywheel
Rotary Transformer
Terminal
④Screw Hole
⑧ Lower Drum
(Lower Cylinder)
②Round Hole

Fig. 7-7-35.

3. Recognizing the SP CH-1 Head Side
No playback picture can be obtained if the video head is not wired as a pair with the rotary transformer located inside the lower drum rotating section. Therefore, mounting position should be matched when mounting the upper drum. In the P91 mechanism series, the code name of the drum is printed on the SP CH-1 (CH-A, plus azimuth) side as a mark for mounting the upper drum. (See Fig. 7-7-36.) This code name differs according to the drum type, but its basic form is as follows :

A = Number of head bases
B = "N" for normal audio
"H" for HI-FI audio
C = Number of heads
D = TV system ("N" or "P")
EF = Code for detailed classification. Depending on drum type, it can also be just one character, or a blank space.

Code Name Form
②Ⓝ④Ⓝ-Ⓠ
A B C D E F

Examples of Detailed Classification Codes
V = Head with level difference
D = Compatible with digital units
S = SVHS-compatible

Examples of Code Names
2N4N-Q
2N4P-Q

Moreover, there is a round hole with marking purposes on the SP CH-1 (CH-A, plus azimuth) side of the lower drum rotary transformer terminal. As shown in Fig. 7-7-37, there are two types of transformer terminals (the number of pins differs according to the number of heads).

Note: When ordering parts such as drums (CYLINDERS), do not use the code names ; always refer to the parts list and order with the specified part numbers.

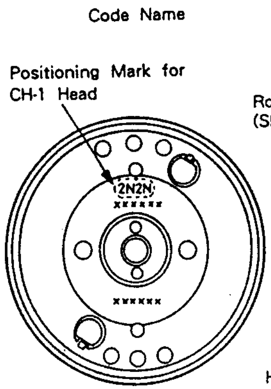

Code Name
Positioning Mark for
CH-1 Head
2N2N
xxxxxx
xxxxxx

Fig. 7-7-36. Upper Drum

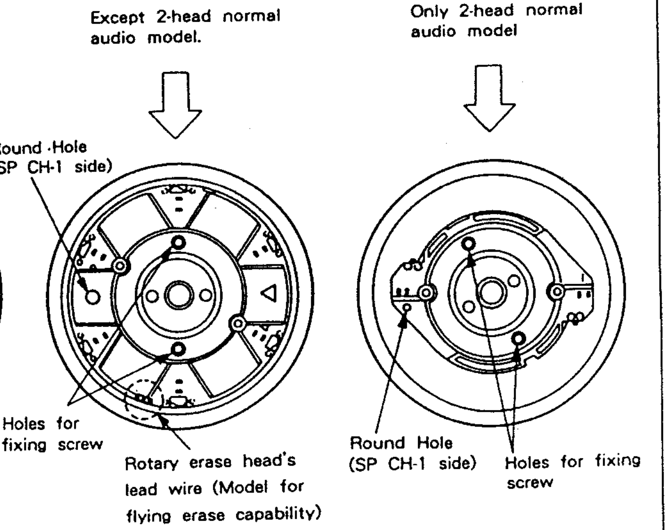
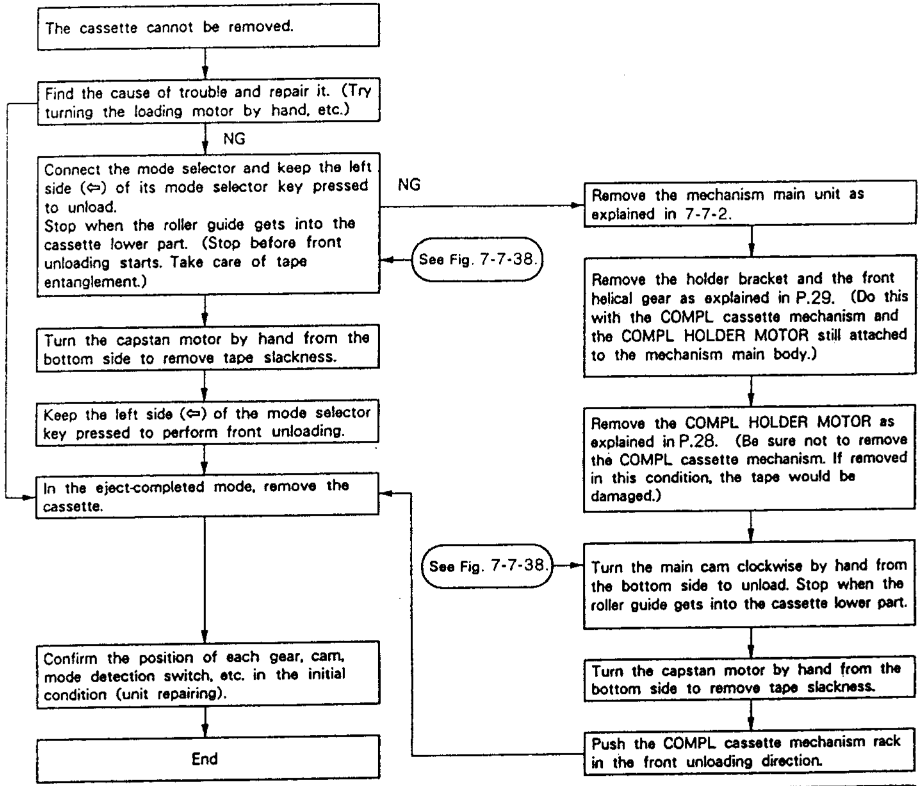
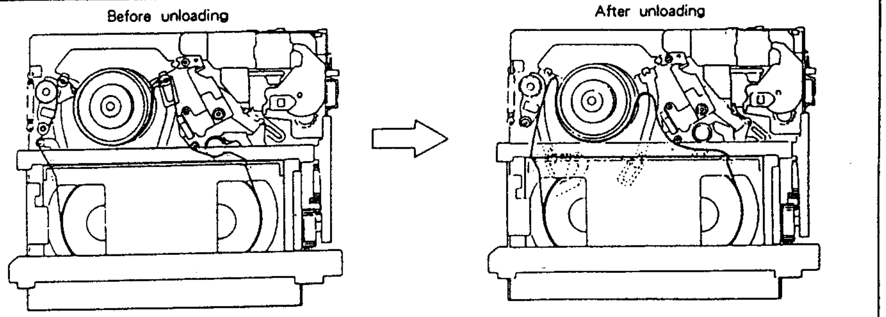

Except 2-head normal
audio model.
Only 2-head normal
audio model
Round Hole
(SP CH-1 side)
Holes for
fixing screw
Rotary erase head's
lead wire (Model for
flying erase capability)
Round Hole
(SP CH-1 side)
Holes for fixing
screw

Fig. 7-7-37. Lower Drum

7-7-12. How to Proceed When The Cassette Cannot Be Removed


The cassette cannot be removed.
Find the cause of trouble and repair it. (Try turning the loading motor by hand, etc.)
NG
Connect the mode selector and keep the left side (⇦) of its mode selector key pressed to unload. Stop when the roller guide gets into the cassette lower part. (Stop before front unloading starts. Take care of tape entanglement.)
NG
See Fig. 7-7-38.
Turn the capstan motor by hand from the bottom side to remove tape slackness.
Keep the left side (⇦) of the mode selector key pressed to perform front unloading.
In the eject-completed mode, remove the cassette.
Confirm the position of each gear, cam, mode detection switch, etc. in the initial condition (unit repairing).
End
Remove the mechanism main unit as explained in 7-7-2.
Remove the holder bracket and the front helical gear as explained in P.29. (Do this with the COMPL cassette mechanism and the COMPL HOLDER MOTOR still attached to the mechanism main body.)
Remove the COMPL HOLDER MOTOR as explained in P.28. (Be sure not to remove the COMPL cassette mechanism. If removed in this condition, the tape would be damaged.)
See Fig. 7-7-38.
Turn the main cam clockwise by hand from the bottom side to unload. Stop when the roller guide gets into the cassette lower part.
Turn the capstan motor by hand from the bottom side to remove tape slackness.
Push the COMPL cassette mechanism rack in the front unloading direction.


Before unloading
After unloading

Perform unloading using the mode selector.

First rotate the capstan motor by hand from the bottom to take-up the tape slack, and perform front-unloading using the mode selector.

Fig. 7-7-38.

SECTION 8
ELECTRICAL ADJUSTMENTS

PREPARATION

EQUIPMENT

- Color TV monitor
- PAL Color-bar generator (with RF and LINE OUTPUT)
- Audio signal generator
- Oscilloscope (dual trace, frequency response : 30MHz or more) (Use a 10:1 probe unless specified otherwise.)
- Vectorscope
- Frequency counter
- AC voltmeter
- In/Output probes

In making the adjustment, an alignment tape for VHS (PAL). If a model is specified, be sure to use a tape of the model.

[Alignment Tape (MH-2)] (H-7099-052-H) (PAL)

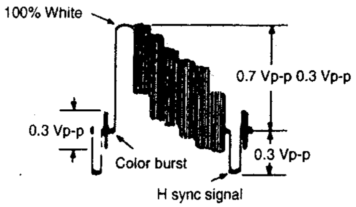
	Mode	Time	Video signal	Audio signal
1	SP	10 minutes	Stair-step	6kHz
2	SP	5 minutes	—	3kHz
3	SP	10 minutes	Color bar	1kHz
4	SP	3 minutes	RF sweep	—

[Alignment Tape (HiFi 400Hz)] (H-7099-175-H) (PAL)

SET-UP

Because the RF input signal is used for circuit adjustments, connect the color-bar generator to the VIDEO IN terminal of the VCR. It is important that the video output signal satisfies the items shown in Connect the oscilloscope to the VIDEO OUTPUT terminal of the TB-1 BOARD and terminate with a 75â+ load, and then check the video output signal.

- The amplitude of the video signal should be approximately 0.3 Vp-p.
- The amplitude of the video signal should be approximately 0.7 Vp-p.
- While observing the oscilloscope or TV screen, make fine-tuning adjustments so that the color burst amplitude is approximately 0.3 Vp-p.
- Check to be sure that there is no spike noise in the sync part of the horizontal sync signal.


100% White
0.7 Vp-p 0.3 Vp-p
0.3 Vp-p
Color burst
0.3 Vp-p
H sync signal

8-1. SERVO CIRCUIT ADJUSTMENTS

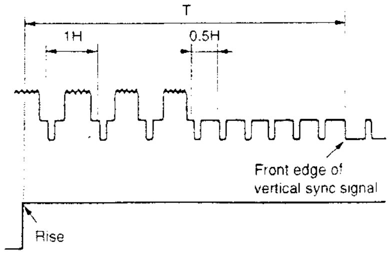
1. SWITCHING POSITION Adjustment

Mode	Playback mode
Signal	Alignment tape (MH-2)
Measurement point	TP183 (RF.SW.PULSE)
Measurement equipment	Oscilloscope
Adjustment element	Front panel (TRACKING button)
Specified value	6.5 ± 0.5H

Adjustment Method

1) Perform the operation check tape MH-2 (SP mode) playback.
2) Within 10 seconds after the playback screen appears, press the REC button three times (the third press should be within two seconds after the start of input and the button should be held down for more than 0.5 seconds) to put the microcomputer into the automatic adjustment mode.
3) In the automatic adjustment mode, "[P:0:00]" is displayed on the indicator tube and switching position adjustment is automatically carried out at the same time.
4) Automatic adjustment is completed when the adjustment value is at about 6.5H.
5) Measure the rising trigger with RF. SW. PULSE (TP183) and check that the front edge of the vertical sync signal is 6.5H slower than the rising of the RF. SW. PULSE. (Fig.8-1)
6) If the adjustment value is outside of the 6.5 ± 0.5H range, press the TRACKING button on the front panel to carry out fine adjustment in the manual mode.
7) When adjustment is completed, press the EJECT button for more than one second to put the adjustment value into memory. The indicator tube will display "[P-:-]" and the operation will be done.

Note: If adjustment takes more than 10 seconds, carry out adjustment again from step 1).



T=6.5H ± 0.5H Fig. 8-1

2. STILL V-LOCK Adjustment

Mode	Self-recording, SP mode
Signal	monoscope pattern
Measurement point	Monitor screen
Measurement equipment	Monitor
Adjustment element	Front panel (TRACKING button)

1) Playback the own recorded portion of the tape and then set the VCR in the STILL mode.
2) Press the TRACKING button so that the vertical shake of picture becomes its minimum.

3. F. SLOW TRACKING CONFIRM and Adjustment

Mode	Self-recording, SP mode
Signal	monoscope pattern
Measurement point	Monitor screen
Measurement equipment	Monitor
Adjustment element	Front panel (TRACKING button)

① Play back the own recorded portion and then set the VCR in the still mode.

② Change to F.Slow play back mode by pressing MENU RESET button more than 1 second.

③ Set the tracking control position to the center by pressing TRACKING(+) and (-) buttons simultaneously, and confirm the absence of noise in the slow playback image on the monitor screen at this centered tracking position.
Starting from this centered tracking position, push the "+" and "-" buttons and confirm that no noise appears before the fifth push in either direction.
If noise appears before the fifth push, fine-tune with the front tracking adjustment button so that no noise appears before the fifth push, then press the REC button to make this point the new tracking center. (When pressing the REC button to enter this new tracking center, the tracking should be displayed.)
The FLD counter readout changes to "P-:-" for approximately one second in order to confirm that data has been entered.

4. R.SLOW TRACKING CONFIRM and Adjustment

Mode	Self-recording, SP mode
Signal	monoscope pattern
Measurement point	Monitor screen
Measurement equipment	Monitor
Adjustment element	Front panel (TRACKING button)

① Play back the own recorded portion and set the VCR in the still mode. and then set R.Still mode by pressing REW button.

② Confirm the absence of noise in the R.Still image on the monitor screen at centered tracking position and strating from this centered tracking position, push the "+" and "-" buttons and confirm that no noise appears before the fifth push in either direction. (setting tracking control during R.F.ADV mode)

③ If noise appears before the fifth push, fine-tune with the tracking adjustment button so that no noise appears before the fifth push. Change to R.slow play back mode by pressing MENU RESET button more than 1 second at R.STILL mode. Then press tracking button "+" or "-" one time and press the REC button to make this point the new tracking center. (When pressing the REC button to enter this new tracking center, the tracking should be displayed.)
The FLD counter readout changes to "P-:-" for approximately one second in order to confirm that data has been entered.

8-2. VIDEO CIRCUIT ADJUSTMENTS

1. AGC LEVEL Adjustment (CP-1 Board)

Mode	E-E
Signal	PAL Color bar
Measurement point	TP101
Measurement equipment	Oscilloscope
Adjustment element	VR102
Specified value	1.00 ± 0.03

Adjustment Method

1) Adjust VR102 so that the level is 1.00±0.03Vp-p.

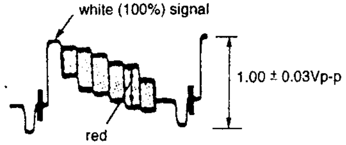


Fig.8-3

2. PB LEVEL Adjustment (CP-1 Board)

Mode	Playback
Signal	PAL Color bar (Self-recording)
Measurement point	TP101
Measurement equipment	Oscilloscope
Adjustment element	VR101
Specified value	1.00 ± 0.03

Adjustment Method

1) Adjust VR101 so that the level is 1.00±0.03Vp-p.

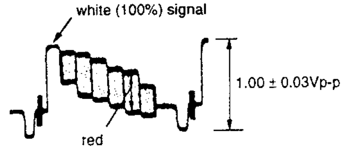


Fig.8-4

3. CARRIER SET and DEVIATION Adjustment (CP-1 Board)

Carrier set	
Mode	E-E
Signal	no-signal
Measurement point	TP121
Measurement equipment	Frequency counter
Adjustment element	VR113
Specified value	3.8 ± 0.03MHz
Deviation	
Mode	E-E
Signal	PAL Color bar
Measurement point	TP121
Measurement equipment	Oscilloscope
Adjustment element	VR115
Specified value	2.00 ± 0.05Vp-p

Adjustment Method

1) Set the E-E mode in the "no signal" state.
2) Connect the frequency counter to TP121 and adjust to 3.8 ± 0.03MHz using VR113.
3) Input the color bar signal and record.
4) Playback the record signal and check the playback Y signal level of TP121.
   Specification: 2.00 ± 0.05Vp-p.
5) When the output is not within the standard, carry out adjustment with VR115 so that the level is 2.00 ± 0.05Vp-p.
6) repeat steps 4) and 5) until the specification is satisfied.

Note: Turn S-VHS switch OFF.

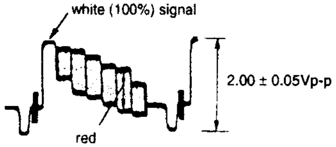


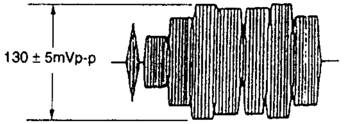
Fig.8-5

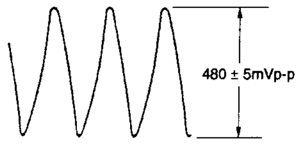
4. REC C/REC Y Adjustment (CP-1 Board)

Mode	Record
Signal	PAL Color bar
Measurement point	TP181
Measurement equipment	Oscilloscope
Adjustment element	VR181(C), VR182(Y)
Specified value	VR181(C):130 ± 5mVp-p VR182(Y): 480 ± 5mVp-p

Adjustment Method

1) Input color-bar signal from LINE IN and turn VR182 to the left as far as possible to minimize the Y signal level.
2) With VR181, adjust the C signal level to 130 ± 5mVp-p.
3) After putting LINE IN into no signal state, adjust the Y signal level (red) to 480 ± 5mVp-p with VR182.





8-3. AUDIO CIRCUIT ADJUSTMENTS

1. BIAS LEVEL Adjustment and FREQUENCY Check (AD-1 Board)

Mode	Playback
Signal	no signal
Measurement point	CN202 pin①(+), pin②(-)
Measurement equipment	A voltmeter, Frequency counter
Adjustment element	VR201

Adjustment Method

1) Adjust VR201 so that the voltage between pin①(+) and pin②(-) of CN204 is 21mVrms. Also, check that the oscillation frequency is 70 ± 5kHz.

2. STILL V-LOCK Adjustment

Mode	STILL mode
Signal	Monoscope (Self-recording)
Measurement point	Picture of monitor TV
Measurement equipment	Monitor TV
Adjustment element	Front panel (TRACKING button)

1) Play back the own recorded portion of the tape and then set the VCR in the STILL mode.
2) Press the TRACKING button so that the vertical shake of picture becomes its minimum.

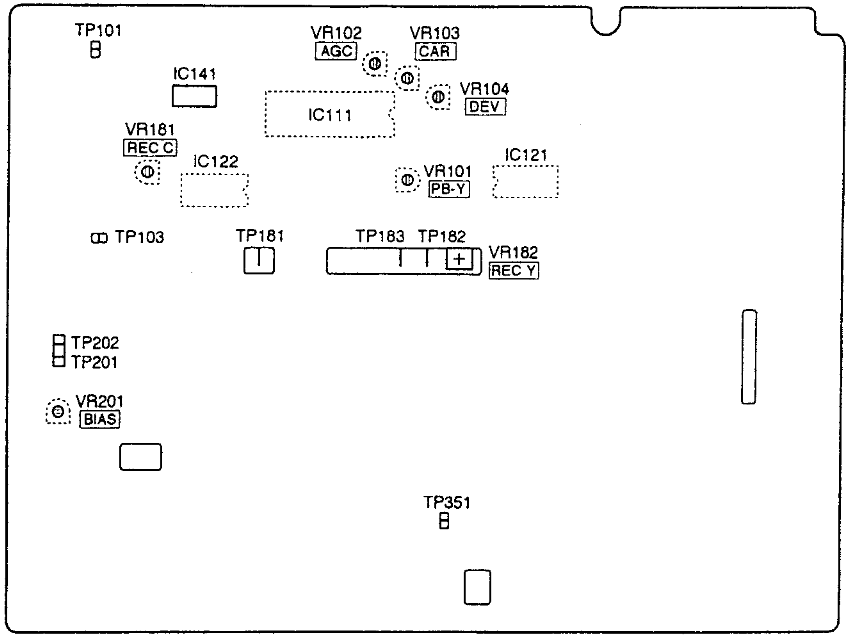
3. CARRIER SET and DEVIATION Adjustment (CP-1 Board)

Carrier set	
Mode	Record
Signal	PAL Color bar
Measurement point	TP103
Measurement equipment	Frequency counter
Adjustment element	VR103
Specified value	4.00 ± 0.03MHz
Deviation	
Mode	Self-recording
Signal	PAL Color bar
Measurement point	TP101
Measurement equipment	Oscilloscope
Adjustment element	VR104
Specified value	1.00 ± 0.03Vp-p

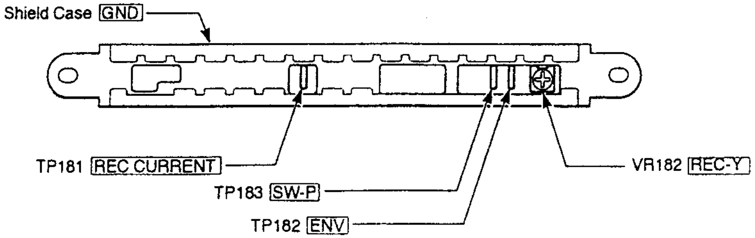
1) Connect the color bar generator to the VIDEO IN terminal.
2) Atterre moving the first color bar signal input from the VIDEO IN terminal, immediately adjust VR103 so that frequency becomes 4.00 ± 0.03MHz.
3) Record the color bar signal on the blank tape.
4) Play back of the just-recorded portion.
5) Adjustment VR104 for 1.00 ± 0.03Vp-p.
6) If the adjustment value is not satisfactory, adjust VR104 and repeat steps 3 to 5.

8-4. PARTS ARRANGEMENT DIAGRAMS FOR ADJUSTMENT

CP-1 BOARD (COMPONENT SIDE)


TP101
VR102
AGC
VR103
CAR
IC141
VR104
DEV
IC111
VR181
REC C
IC122
IC121
VR101
PB-Y
TP103
TP181
TP183
TP182
VR182
REC Y
TP202
TP201
VR201
BIAS
TP351

PRE-AMP Unit (VP-1 BOARD)


Shield Case GND
TP181 REC CURRENT
TP183 SW-P
TP182 ENV
VR182 REC-Y

VP-1 PWB Assembly